THE EFFICACY OF AN INTERNET-BASED COMPREHENSIVE BEHAVIORAL

INTERVENTION FOR THE TREATMENT OF TRICHOTILLOMANIA

By

Kate E. Rogers

Submitted to the

Faculty of the College of Arts and Sciences

of American University

in Partial Fulfillment of

the Requirements for the Degree of
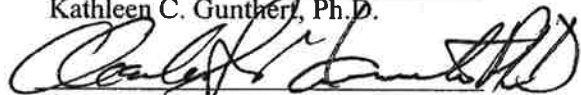
Doctorate of Philosophy

In

Clinical Psychology

Chair: _____

David A.F. Haaga, Ph.D.

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Dean of the College of Arts and Sciences

_June 26, 2014_____

Date

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ABSTRACT

In an effort to enhance trichotillomania (TTM) treatment accessibility an Internet-based self-help program—StopPulling.com—was developed based on the Comprehensive Behavioral (ComB) model of TTM. This study conducted the first randomized controlled trial of StopPulling.com with sixty adults with TTM. This study also investigated the mechanism of change involved in the ComB model by examining whether selective matching of coping strategies to hairpulling modalities (i.e., cognitive, affective, motoric, sensory, and environmental) predicted treatment outcome.

It was expected that participants would experience significantly greater decreases in TTM severity and associated functional impairment after ten weeks of StopPulling.com than after ten weeks of a waitlist condition. Although participants experienced significant reductions in TTM severity and associated impairment over the course of ten weeks, there were no significant differences in these reductions between participants who received ten weeks of StopPulling.com and those who received ten weeks of the waitlist condition. It was also expected that participants with the highest modality-strategy match scores would experience the greatest reductions in TTM severity and associated impairment. However, the average modality-strategy match score was not significantly correlated with functional impairment nor any measures of TTM severity.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Trichotillomania (TTM) is a disorder characterized by the recurrent pulling out of one's own hair, resulting in hair loss (American Psychiatric Association, 2013). In recent years, the importance of understanding the phenomenology and providing effective treatment of TTM has gained significant attention in the mental health field.

Prevalence rates of TTM are largely unknown, due to significant limitations of epidemiological research. These limitations most notably include the use of small sample sizes and inconsistent inclusion criteria between epidemiological studies (e.g., disagreement about diagnostic criteria among researchers). Prevalence rates of TTM have been estimated between 0.6% (Christenson, Pyle, & Mitchell, 1991; Duke, Bodzin, Tavares, Geffken, & Storch, 2009) and 3.4% (Christenson et al., 1991) in the general population. This is comparable to the prevalence rates of obsessive-compulsive disorder (Adam, Meinischmidt, Gloster, & Lieb, 2012) and anorexia nervosa (Pope, Hudson, Yurgelun-Todd, & Hudson, 1984).

In addition to the direct effects of hairpulling (e.g., hair loss), individuals with TTM also experience significant psychosocial impairment. Individuals with TTM report significantly higher levels of disability (Diefenbach, Tolin, Hannan, Crocetto, & Worhunsky, 2005) and significantly lower life satisfaction (Diefenbach, Tolin, Hannan, et al., 2005), self-esteem (Diefenbach, Tolin, Hannan, et al., 2005), and quality of life (Odlaugh, Kim, & Grant, 2010) than healthy controls. Individuals with TTM have also been found to avoid social situations, seek help from multiple health professionals, waste significant amounts of time engaged in hairpulling activities, and experience both occupational and academic interference (Wetterneck, Woods, Norberg, & Begotka,

2006). The prevalence of and significant impairment associated with TTM indicate the strong need for accessible and effective treatment for this disorder.

Efficacy of TTM Treatment Interventions

Pharmacological interventions have included selective serotonin reuptake inhibitors (SSRIs), clomipramine, and N-Acetylcysteine in the treatment of TTM. Findings of a meta-analysis (Bloch et al., 2007) have suggested no significant differences in reduction of hairpulling symptoms between treatment with SSRIs (such as fluoxetine and sertraline) and treatment with placebos. Bloch et al.'s (2007) meta-analysis also evaluated the efficacy of clomipramine, finding treatment with clomipramine to be significantly more effective than treatment with a placebo. However, this finding has been inconsistent. For example, Ninan, Rothbaum, Martsteller, Knight, and Eccard (2000) found no significant difference in treatment outcome between clomipramine and placebo conditions. Furthermore, treatment with clomipramine has been found to be less effective than behavioral intervention—specifically habit reversal training (Bloch et al., 2007). A single randomized controlled trial has been conducted to compare the treatment effects of N-Acetylcysteine and a placebo condition (Grant, Odlaug, & Kim, 2009). Results showed significantly greater reduction in hairpulling severity following twelve weeks of N-Acetylcysteine. However, these results have yet to be replicated with an adult sample. A similar randomized control trial was conducted in 2013 with a child and adolescent sample (Bloch, Panza, Grant, Pittenger, & Leckman) and found no significant difference in outcome measures between those who received 12 weeks of N-Acetylcysteine and those who received 12 weeks of a placebo. Overall, research regarding pharmacological treatment for TTM has used

very few randomized controlled trials, and has either found a lack of significance in the reduction of hairpulling symptoms or has demonstrated inconsistencies across empirical literature.

The treatment of choice for TTM is psychotherapy—most commonly cognitive and behavioral therapies (Golomb et al., 2011), such as Behavior Therapy (BT) and variations of Habit Reversal Training (HRT). Studies of BT for TTM have found some positive (although limited) treatment effects. Keijsers, van Minnen, Hoogduin, Klaassen, Hendriks, and Tanis-Jacobs (2006) found a significant decrease in hairpulling symptoms following six sessions of BT (including stimulus control, competing response, and response consequences). However, treatment gains were not maintained at two-year follow-up. After applying BT in a group format, Diefenbach, Tolin, Hannan, Maltby, and Crocetto (2006) found significantly greater decreases in self-reported hairpulling symptoms and clinician-rated hair loss severity, compared to both supportive group therapy and a naturalistic waiting period. However, overall hairpulling severity remained problematic even after receipt of the group BT.

The most extensively researched intervention for TTM is HRT (Golomb et al., 2011), which consists of awareness training and competing response training as its hallmark components (Azrin & Nunn, 1973). Awareness training involves asking the client to describe details of hairpulling movements and teaching the client to detect the earliest sign of these movements. Awareness training also involves increasing awareness of situations in which hairpulling occurs, by asking the client to recall those situations and describe how hairpulling is performed in each one. Competing response training involves practicing a behavioral pattern that is incompatible with the hairpulling behavior. A meta-analysis by Bloch et al. (2007) found a significant benefit of HRT in the reduction of hairpulling symptoms compared to waiting list and

placebo conditions. Bloch et al. (2007) concluded that HRT, when practiced by experienced clinicians in academic research settings, is the most effective approach for the treatment of TTM.

In recent years, treatment approaches that combine traditional elements of HRT and elements of alternative treatment approaches have gained considerable popularity. For example, HRT has been combined with elements of Cognitive Behavioral Therapy (CBT), such as self-monitoring, stimulus control, relaxation training, cognitive restructuring, and relapse prevention methods. This combined treatment approach has been evaluated by Lerner, Franklin, Meadows, Hembree, and Foa (1998). Results indicated significant reductions in both TTM symptom severity and associated impairment following nine individual sessions. However, on average, treatment gains were not maintained at follow-up—with no significant difference found between pre-treatment symptom severity and follow-up symptom severity, and only 4 of the 13 treatment completers were classified as responders at follow-up.

HRT has also been combined with Acceptance and Commitment Therapy (ACT) in an effort to enhance the efficacy of TTM treatment. Flessner, Busch, Heideman, and Woods (2008) evaluated this treatment approach and found a significant reduction in hairpulling frequency following ten sessions of combined HRT and ACT. However, this study used a very small sample size ($n = 6$), did not include a control condition, and collected no follow-up data. Twohig and Woods (2004) found that the combination of HRT and ACT resulted in decreasing the number of hairs pulled, with treatment gains maintained for some participants at three-month follow-up. Unfortunately, this study also used a very small sample size ($n = 6$), and only some participants maintained treatment gains. Woods, Wetterneck, and Flessner (2006) found significant reductions in hairpulling severity, impairment, and number of hairs pulled following ten sessions of combined HRT and ACT, compared to a waiting list control condition. Treatment

4

gains were generally maintained at three-month follow-up. Although this randomized controlled trial has shown the most support for the efficacy of combined HRT and ACT in the treatment of TTM, the findings are somewhat unclear in terms of maintenance of treatment gains at 3-month follow-up. While treatment gains were maintained with respect to clinician-rated hairpulling severity and self-reported number of hairs pulled, self-reported hairpulling severity significantly increased between post-treatment and 3-month follow-up—suggesting significant relapse.

Most recently, HRT has been combined with Dialectical Behavioral Therapy (DBT) in an effort to enhance treatment of TTM by targeting the role of emotion regulation in hairpulling behavior. Keuthen et al. (2010) evaluated this treatment approach and found significant improvement in hairpulling severity and emotion regulation following the receipt of DBT-enhanced HRT. Treatment gains were maintained at three-month follow-up and six-month follow-up (Keuthen et al., 2011). Unfortunately, this study was significantly limited by a small sample size ($n = 10$) and the absence of a control condition. Thus, Keuthen et al. (2012) conducted another similar study as a randomized controlled trial with a larger sample size ($n = 38$). Keuthen et al. (2012) found a significant reduction in TTM severity following 11 weeks of DBT-enhanced HRT, and this finding was maintained at both 3-month follow-up and six-month follow-up. Keuthen et al. (2012) also found a greater reduction in TTM severity following 11 weeks of DBT-enhanced HRT, compared to 11 weeks of a minimal attention control condition (in which participants received weekly phone calls to assess safety and general functioning but were not questioned about TTM or given any TTM-related advice).

Unfortunately, empirical literature regarding the efficacy of TTM interventions is sparse and suffers from several methodological limitations. Although previous research has shown some support for the efficacy of a variety of treatment interventions for TTM, most treatment

5

studies have lacked randomization and control conditions; the research has been plagued by small sample sizes; and findings have been grim in terms of maintenance of treatment gains. The need exists for a treatment approach that consistently yields positive and maintainable outcomes among the broad range of TTM sufferers.

Accessibility of Treatment

The existing empirical literature seems to point to two TTM interventions as the most likely to be successful—HRT (Bloch et al., 2007) and DBT-enhanced HRT (Keuthen et al., 2012). Both of these interventions have been researched and are typically provided in an in-person format by trained professionals. For example, Keuthen et al.'s (2012) DBT-enhanced treatment approach involves 11 to 15 sessions of in-person treatment. Unfortunately, access to such treatment resources is very limited, with a very small percentage of clinicians receiving sufficient training in the treatment of TTM. In 2006, Woods, Flessner, et al. conducted a large-scale Internet survey of hairpullers, which involved asking participants about the perceived TTM-related knowledge of their healthcare and mental health providers. Woods, Flessner, et al. (2006) found that 28% of participants reported that the provider was not at all knowledgeable, 28% reported that the provider had heard of TTM, 34% of participants reported that the provider had some information about TTM, 12% of participants reported that the provider knew much about TTM, and only 3% of participants reported that the provider was a TTM expert. Furthermore, in a survey of general practitioners, psychiatrists, and psychologists, Marcks, Wetterneck and Woods (2006) found that 72% of participants thought that medication was an effective treatment for TTM and only 54% of participants thought that cognitive behavioral therapy was an effective treatment for TTM.

Given the limited resources available to TTM sufferers (e.g., the relatively small number of clinicians trained in TTM treatment), many individuals are likely to have significant difficulty finding in-person treatment. The need exists for an effective TTM intervention that is easily accessible to the public.

The Comprehensive Behavioral Model of TTM

The Comprehensive Behavioral (ComB) model of TTM was introduced by Mansueto, Golomb, Thomas, and Stemberger (1999). The ComB model consists of four general phases of treatment: (1) assessment and functional analysis, which involve the identification of antecedents, behaviors, and consequences that maintain hairpulling behavior; (2) identification of hairpulling modalities (i.e., **cognitive**, **affective**, **motoric**, **sensory**, and **environmental** modalities); (3) selection and implementation of customized treatment strategies, based on hairpulling modalities; and (4) evaluation and modification of treatment strategies.

The first general phase of the ComB model—assessment and functional analysis— consists of three distinct treatment steps. The first step is to come to an agreement between therapist and client to specifically target the hairpulling behavior rather than some other problem. The second step is to identify functional components, such as external cues (e.g., hairpulling tools and settings where hairpulling occurs), internal cues (e.g., thoughts, emotions, or sensations), sequence of hairpulling rituals (e.g., preparation, hair removal, and hair disposition), and consequences of hairpulling (both positive and aversive consequences). The third step is to begin self-monitoring of hairpulling behavior, which involves recording a variety of variables for each hairpulling episode.

The second phase—identification of hairpulling modalities—consists of two distinct treatment steps. The first step is to identify potential hairpulling modalities to be targeted, by

organizing functional components according to the primary modality through which each component functions. The second step is to select the target modalities that will be the focus of treatment strategies. This involves the identification of "prominent modalities"—the modalities that play a role across the client's hairpulling pattern. Although multiple modalities may be present in the client's hairpulling pattern, the modalities that are most common, most powerful, or most likely to be responsive to change are selected during this treatment step.

The third phase—selection and implementation of treatment strategies—consists of three distinct treatment steps. The first step is to identify potential treatment strategies within the selected modalities. (See Table 1 for a list of potential treatment strategies for targeting each modality.) The second step is to identify the treatment strategies that are most likely to be used by the client. This step involves presenting the client with several recommended options and allowing the client to choose which option(s) will be most helpful. It is not uncommon for a client to use multiple strategies that simultaneously operate through different modalities. The third step is to train the client in the use of the chosen treatment strategies and to implement the use of these strategies for at least one week before evaluating their usefulness.

Table 1

Potential Treatment Strategies by Target Modality

Target Modality	Potential Treatment Strategies
Cognitive	Cognitive correction Thought-Stopping Cognitive restructuring Coping statements
Affective	Emotional self-regulation (e.g., progressive muscle relaxation, positive visualization, etc.) Stress management skills In-vivo or imaginal exposure Medication Physical exercise
Motoric	Awareness training (e.g., self-monitoring, etc.) Response prevention (e.g., fist clenching, keeping fingernails short, using devices that physically impede hairpulling, etc.)
Sensory	Stimulus control Distraction Substitution Extinction Medication
Environmental	Stimulus control (e.g., covering mirrors, removing tweezers, etc.) Contingency management Punishment

The fourth and final phase of the ComB model—evaluation—consists of two distinct treatment steps. The first step is to evaluate the effectiveness of treatment strategies through self-monitoring of the client's hairpulling and use of the strategies. The final step is to select and implement the next direction of treatment, based on the evaluation of treatment strategies. The next direction of treatment may involve one or more of the following: (1) maintenance of use of currently effective treatment strategies; (2) selection of at least one additional treatment strategy; (3) abandonment of currently ineffective treatment strategies and selection of alternative treatment strategies; and (4) consideration of modifications to current treatment strategies.

Much like other TTM interventions, the ComB model was originally developed as an in-person treatment. In an effort to enhance accessibility to effective treatment for TTM, a small group of licensed psychologists created StopPulling.com. This online, interactive, self-help program consists of three treatment modules—assessment (e.g., self-monitoring), intervention (e.g., recommendation of specific coping strategies), and maintenance—which are based on the four general phases of the ComB model.

The ComB model has demonstrated promising outcomes based on anecdotal evidence (Golomb et al., 2011) and a single uncontrolled study of StopPulling.com (Mouton-Odum, Keuthen, Wagener, Stanley, & Debakey, 2006). However, the ComB model has yet to be empirically evaluated using a randomized controlled trial. The only empirical study to date that involves the ComB model is a preliminary study of StopPulling.com. Mouton-Odum, Keuthen et al. (2006) collected preliminary data from 265 users of StopPulling.com during the first year the program was available to the public. Mouton-Odum et al. (2006) found some positive treatment effects, including significant reduction in hairpulling behavior from baseline to final ratings and significant reduction in the number of hairs pulled from baseline to final ratings. However, a significant increase in urge severity was also found from baseline to final ratings. Interestingly, a significant reduction in hairpulling behavior was found from baseline to intervention onset, with no further change found from intervention onset to final ratings. Despite the promising, but mixed, findings of this preliminary study, randomization and control conditions are clearly needed in future research evaluating the efficacy of this treatment approach.

Although the ComB model is similar to the enhanced versions of HRT for TTM, it may have distinct advantages. The potential advantages of the ComB model include its emphasis on the wide variety of hairpulling behaviors, its flexibility to accommodate the needs of a

heterogeneous client population, and its availability in an Internet-based format for enhanced accessibility. With these in mind, the efficacy of the ComB model certainly warrants further investigation.

Mechanism of Change

In addition to investigating the efficacy of available treatment approaches for TTM, it is also important to understand the mechanism of change involved in effective treatment approaches. If the mechanism of change can be determined, then treatment resources can be used most effectively and efficiently. Research has yet to be conducted to directly investigate the mechanism of change involved in the treatment of TTM.

The theoretical foundation of the ComB model includes an acknowledgement of the heterogeneous nature of the TTM population, an assumption that TTM sufferers engage in hairpulling behavior through certain modalities (environmental, motoric, sensory, affective, and cognitive), and a prediction that the selection and use of treatment strategies that target these particular modalities will improve treatment outcome (Mansueto et al., 1999). However, this has never been empirically investigated. Thus, the mechanism of change involved in the ComB model remains entirely theoretical.

Purpose of the Current Study

The primary purpose of the current study was to conduct the first randomized controlled trial of StopPulling.com. In an effort to determine the mechanism of change involved in the ComB model, the current study also examined whether selective matching of treatment strategies to hairpulling modalities predicts treatment outcome. The current study tested the following hypotheses: (1) decrease in TTM severity will be significantly greater after ten weeks of StopPulling.com than after ten weeks of a waitlist condition; and (2) reduction in functional

11

impairment associated with TTM will be significantly greater after ten weeks of StopPulling.com than after ten weeks of waitlist condition. Exploratory analyses were also conducted to examine whether (1) participants who consistently employ treatment strategies that match their active hairpulling modalities (e.g., cognitive strategies employed during a hairpulling episodes that involve a cognitive modality) will experience the greatest reduction in TTM severity; and (2) participants who consistently employ treatment strategies that match their active hairpulling modalities will experience the greatest reduction in functional impairment associated with TTM.

METHODS

The current study used data, collected between 2010 and 2012 as part of a larger NIH-funded study investigating the efficacy of a stepped care approach to the treatment of TTM.

Participants

Sixty adults with TTM were recruited from the community in the greater Washington, DC area. Participants were recruited through advertisement in a local newspaper, online advertisements (e.g., ClinicalTrials.gov, StopPulling.com, trich.org, Facebook, and Twitter), and referrals from local clinicians. All participants were at least 18 years of age, met DSM-IV-TR diagnostic criteria for TTM (with or without endorsement of criterion B—tension before pulling—and criterion C—pleasure, relief, or gratification when pulling), and had regular access to the Internet. Participants were not required to meet criteria B or C so that participants with clinically significant hair pulling would not be excluded from the study. Recent research has suggested that criteria B and C do not differentiate individuals with clinically significant hair pulling from individuals without clinically significant hair pulling (Conelea et al., 2012).

Prospective participants were excluded from participation if they reported any of the following within one month prior to study enrollment: (1) suicidality; (2) major depressive episode; (3) psychosis; (4) severe anxiety; or (5) substance abuse. Prospective participants were also excluded if they were already in concurrent psychotherapy for TTM, or if they were taking medication for TTM and had not been on a stable dose for at least four weeks.

Participants were compensated with $20 each time they completed an assessment session. They were also compensated with an additional $50 for successful completion of the entire study.

Measures

Due to an absence of a single gold-standard measure of TTM severity, a multi-method approach to treatment outcome measures has been recommended (Duke, Keeley, Geffken, & Storch, 2010). The current study applied a multi-method approach, using three measures to assess treatment outcome.

Psychiatric Institute Trichotillomania Scale (PITS; Winchel et al., 1992). The PITS is a six-item, clinician-rated, semi-structured interview designed to assess TTM severity. Each item measures a particular aspect of hairpulling behavior (e.g., hairpulling sites, duration of pulling, resistance, interference, distress, and severity of hair loss) on a 0 to 7 scale, with higher numbers indicating greater impairment (see Appendix A). Item scores are summed to produce a total score of TTM severity. The PITS has demonstrated moderate to strong interrater reliability for most items (Stanley, Breckenridge, Snyder, & Novy, 1999; Diefenbach, Tolin, Crocetto, Maltby, & Hannan, 2005). However, interrater reliability for the distress item has not been consistently good across psychometric studies (Stanley et al., 1999; Diefenbach, Tolin, Crocetto, et al., 2005). Convergent validity with other clinician-rated measures of TTM severity has also been demonstrated for some, but not all, PITS items (Stanley et al., 1999). The PITS has generally demonstrated poor internal consistency ($\alpha = .59$ to .60) (Stanley et al., 1999; Diefenbach, Tolin, Crocetto, et al., 2005). Administration of the PITS was video-recorded in the current study, and a 20% random sample of the videos was selected and coded by a second rater to assess interrater reliability (ICC = .82). The second rater was unaware of the assessment point at which each video was taken. Due to the psychometric limitations of the PITS, a self-report measure of TTM severity was also included as an outcome measure in the current study.

Massachusetts General Hospital Hairpulling Scale (MGH-HS; Keuthen et al., 1995). The

MGH-HS is a 7-item self-report measure designed to assess the severity of hairpulling during the

previous week. The first three items measure frequency, intensity, and perceived ability to

control hairpulling urges. The next three items measure the frequency, efforts to resist, and

successful control of actual hairpulling behavior. The final item measures the degree of distress

associated with hairpulling. Each item is rated on a 0 to 4 scale, with higher numbers indicating

greater severity. The sum of all items produces a total severity score between 0 and 28. The

MGH-HS has demonstrated good internal consistency (α = .89) (Keuthen et al., 1995) and good

test-retest reliability over a period of one hour (r = .97) (O'Sullivan et al., 1995). It has also

demonstrated adequate convergent validity with clinician-rated measures of TTM severity

(O'Sullivan et al., 1995; Diefenbach, Tolin, Crocetto, et al., 2005), as well as divergent validity

with measures of anxiety and depression (O'Sullivan et al., 1995). The MGH-HS is often used as

a treatment outcome measure and has demonstrated sensitivity to change over time (O'Sullivan

et al., 1995). The current study used the MGH-HS as the primary self-report outcome measure

(see Appendix B.)

Alopecia Rating. The Alopecia Rating is a single-item measure of hair loss severity,

based on digital photographs of participants' hairpulling sites. Digital photographs are rated on a

1 ("Normal—No evidence of hairpulling") to 7 (Severe—Large bald spots that are difficult to

conceal") (see Appendix C). Two student raters complete alopecia ratings for each digital

photograph, and are masked to assessment point and experimental condition. This method has

been used by Diefenbach, Tolin, Crocetto, et al. (2005) and has demonstrated good interrater

reliability (r = .93). However, it failed to demonstrate strong construct validity in that it did not

correlate significantly with clinician-rated measures of TTM severity. The current study used Alopecia Ratings to supplement self-report and clinician-rated outcome measures.

Sheehan Disability Scale (SDS; Sheehan, 1983). The SDS is a 3-item self-report measure designed to assess impairment in three areas of functioning—work/school, social life, and family life/home responsibilities. Each item is scored on a 0 ("not at all") to 10 ("extremely") scale (see Appendix D). The sum of all items produces a total disability score between 0 and 30, with higher scores indicating greater impairment. The SDS has demonstrated good test-retest reliability, internal consistency, convergent validity with clinician-rated global assessment of functioning, and sensitivity to symptom change in patients with bipolar disorder (Arbuckle et al., 2009). The SDS has also been found to correlate positively with TTM symptom severity (Woods, Flessner, et al., 2006). The current study used the SDS to assess functional impairment associated with TTM.

Self-Monitoring of Hairpulling Episodes and Modality-Strategy Match Scores. Informed consent involved all participants granting permission to the researchers of the current study to collect participants' self-monitoring data and information about program usage from StopPulling.com. During the intervention module of StopPulling.com, participants record the following self-monitoring information each time they experience a hairpulling episode: (1) date of the hairpulling episode; (2) time of day of the episode; (3) severity of hairpulling urge; (4) place where the participant was during the episode; (5) activity in which the participant was engaged when the episode occurred; (6) number of hairs pulled; (7) hair pulling site; (8) motor behaviors involved in hairpulling; (9) physical sensations that triggered hairpulling; (10) emotions before, during, and after hairpulling; (11) thoughts before, during, and after hairpulling; (12) what was done with the hair after pulling it; and (13) what, if any, treatment strategies were

16

applied to the hairpulling episode. (See Appendix F for a detailed list of treatment strategies suggested by StopPulling.com.)

In the current study, an **environmental modality** was considered to be present during a hairpulling episode if the participant recorded engaging in a particular activity when the hairpulling occurred. Each time a participant recorded a hairpulling episode on StopPulling.com, he/she was prompted to select an associated activity (see Appendix G for a full list of activities), thought (see Appendix H for full list of thoughts), emotion (see Appendix I for full list of emotions), physical sensation (see Appendix J for full list of sensations), and motor behavior (see Appendix K for full list of motor behaviors). Although participants were prompted to record each piece of information, they were not required to do so, and they were instructed to record "none" for any piece of information that was absent during his/her hairpulling episode. A **cognitive modality** was considered to be present if the participant recorded experiencing particular thoughts immediately before the hairpulling occurred. An **affective modality** was considered to be present if the participant recorded experiencing particular emotions immediately before the pulling occurred. A **sensory modality** was considered to be present if the participant recorded experiencing particular physical sensations during the hairpulling episode. A **motoric modality** was considered to be present if the participant recorded particular motor behaviors involved in the hairpulling episode. It is important to note that for a given episode there may be more than one active modality. For example, an individual who reports pulling while watching television at the end of a stressful day, may be experiencing both environmental and affective modalities during the same hairpulling episode.

The specific treatment strategies suggested by StopPulling.com have been designed to target one or more hairpulling modalities. For the purposes of the current study, the following

treatment strategies were considered consistent with the **environmental modality**: (1) change activity; (2) avoid mirrors; (3) avoid television; (4) throw away hairpulling tools; and (5) ask for help. The following treatment strategies target the **motoric modality**: (1) bandaids/gloves; (2) hand toys; (3) fist-clenching; (4) keep hands away from face/hair; (5) barriers; (6) change posture; (7) change activity; and (8) ask for help. The following treatment strategies were considered consistent with the **sensory modality**: (1) hand toys; (2) pleasurable activity; (3) brush hair/wash hair; and (4) chew gum. The following treatment strategies were considered consistent with the **affective modality**: (1) relaxation; (2) pleasurable activity; (3) ask for help; and (4) thought busting. The following treatment strategies were considered consistent with the **cognitive modality**: (1) ask for help; and (2) thought busting.

The self-monitoring data collected through StopPulling.com was used to generate five modality-strategy match scores (environmental, cognitive, affective, sensory, and motoric), using a technique developed for the purposes of the current study (see Appendix E). For example, **the environmental modality-strategy match score** was calculated by first dividing the number of hairpulling episodes, in which an environmental modality was reported and an environmental strategy was applied, by the total number of hairpulling episodes, in which an environmental modality was reported. The resulting number was then multiplied by 100 to generate the environmental modality-strategy match score. Each modality-strategy match score ranges from 0 to 100, with higher numbers indicating more consistent use of treatment strategies that match the participant's hairpulling modalities. An **average match score** was also derived to represent the participant's overall tendency to apply treatment strategies that are consistent with active hairpulling modalities. The average match score was calculated by taking the sum of the modality-strategy match scores and dividing it by the number of modality-strategy match scores.

18

According to this operationalization, failing to use an appropriate strategy will negatively affect the average match score, while using an inappropriate strategy will have no effect on the average match score. For example, a participant who used an environmental strategy and a cognitive strategy for a hairpulling episode that only had an active environmental modality would receive the same score as a participant who only used an environmental strategy for a hairpulling episode that only had an active environmental modality. Furthermore, match scores are only affected by the frequency of treatment strategy use as it relates to the frequency of hairpulling episodes. For example, if a participant records three hairpulling episodes with a cognitive modality and uses an appropriate treatment strategy for each of those three episodes, the participant would receive a cognitive modality-strategy match score of 100. However, if a participant records ten hairpulling episodes with a cognitive modality and uses an appropriate treatment strategy for five of those ten episodes, the participant would receive a cognitive modality-strategy match score of 50 (even though the second participant practiced appropriate treatment strategies more often than the first participant).

Modality-strategy match scores were calculated using only data from participants who recorded self-monitoring data during the second module of StopPulling.com. Data was used only from participants who recorded self-monitoring data during the second module of StopPulling.com because these were the only participants who had been provided treatment strategy recommendations.

It is also important to note that the list of treatment strategies provided by StopPulling.com is relatively narrow. It is certainly possible for a participant to apply a strategy that was learned outside of StopPulling.com to a hairpulling episode. Use of such a strategy

would not be recorded in the participant's self-monitoring information on StopPulling.com, and thus would not be reflected in the participant's modality-strategy match scores.

Treatment—StopPulling.com

StopPulling.com is an online, interactive, self-help program consisting of three treatment modules—the assessment module, the intervention module, and the maintenance module. Upon accessing StopPulling.com, participants begin the **assessment module**, which consists of six submodules and primarily involves daily monitoring and recording of each episode of hairpulling behavior. As participants progress through the six submodules, they are prompted to record increasingly detailed information about their hairpulling episodes. The first submodule primarily asks participants to notice and record the activities in which they are engaging when hairpulling occurs. The second submodule asks participants to notice and record both activities and the sequence of motor behaviors involved in hairpulling. The third submodule asks participants to notice and record those aspects of hairpulling behavior, as well as any physical sensations that may trigger hairpulling episodes. The fourth submodule asks participants to add information about their emotions to the list of self-monitoring information—recording participants' emotions before, during, and after each hairpulling episode. The fifth submodule continues to ask for additional self-monitoring information—asking participants to also record their thoughts before, during, and after each hairpulling episode. The sixth and final submodule asks participants to notice and record all aspects of hairpulling episodes included in the previous submodules, as well as information about what they do with the hair after pulling it. Participants engage in the assessment module for 2-5 weeks, before progressing to the intervention module.

During the **intervention module**, participants continue monitoring and recording information about their hairpulling episodes; however, they also begin to receive customized

recommendations for specific treatment strategies (based on the self-monitoring data recorded), as well as detailed explanations about the rationale for and application of each strategy. (See Appendix F for a full list of treatment strategies and explanations provided by StopPulling.com.) Participants are then asked to record their use of these treatment strategies as part of their self-monitoring information. During this module, participants are also given visual feedback about their hairpulling patterns and treatment progress in the form of charts and graphs. Participants are also asked to set weekly goals for themselves and reward themselves when those goals are achieved. Together, the assessment and intervention modules are designed to take a total of about 7 to 10 weeks to complete.

Participants progress to the third and final module after successfully achieving their goals for 4 consecutive weeks. The final module of StopPulling.com is the **maintenance module**. The purpose of this module is to maintain treatment gains. It involves continued weekly goal setting, as well as continued self-monitoring of hairpulling episodes and application of treatment strategies. Typically, StopPulling.com users may remain in the maintenance module indefinitely; however, the current study focused only on the 10 weeks of free access to StopPulling.com, the bulk of which were spent in the assessment and intervention modules.

Procedure

The current study used data, collected between 2010 and 2012 as part of a larger investigation of a stepped care approach to the treatment of TTM. Participation in this larger study involved engaging in two levels of treatment and completing a series of in-person assessments. The first level of treatment was 10 weeks of free access to StopPulling.com, and the second level of treatment was in-person individual psychotherapy. The current study focused

21

exclusively on the first level of treatment—StopPulling.com—and only used data collected before participants were offered the second level of treatment—in-person psychotherapy.

All participants first completed an initial phone screen to determine eligibility. Eligible participants then completed an in-person baseline assessment with a graduate student research assistant. At the baseline assessment, participants completed a battery of self-report and interview measures, which included the PITS, MGH-HS, and SDS. If consent was given, then digital photographs of each participant's hairpulling sites were also taken at the baseline assessment. At the conclusion of the baseline assessment, participants were randomly assigned to one of two experimental conditions—immediate treatment or waitlist. These random assignments were pre-determined based on participants' ID numbers and were unknown to the experimenter prior to the conclusion of the baseline assessment.

Participants assigned to the immediate treatment condition were given immediate free access to 10 weeks of StopPulling.com, as well as instructions for accessing the website. Participants were not required to use StopPulling.com during this time, but were simply given the opportunity to do so without charge. During participants' use of StopPulling.com, bulk statistics about program usage and self-monitoring data were collected through the website. Participants received a brief phone check-in 5 weeks after baseline assessment. This phone check-in served as a safety precaution to identify any participants whose TTM symptoms had significantly worsened during the first step of treatment. After 10 weeks of access to StopPulling.com, participants in the immediate treatment condition returned for another in-person assessment—the post-step 1 assessment. This assessment again included the PITS, MGH-HS, SDS, and digital photographs of hairpulling sites.

Participants assigned to the waitlist condition were provided with no treatment intervention for the 10 weeks following the baseline assessment. However, participants in this condition did receive a mid-waitlist phone check-in 5 weeks after the baseline assessment. This phone check-in served as a safety precaution to identify any participants whose TTM symptoms had significantly worsened during the waitlist condition. Such participants were given immediate access to the treatment intervention. Otherwise, after the 10 weeks of no treatment intervention, participants assigned to the waitlist condition completed another in-person assessment—the post-waitlist assessment. This assessment again included the PITS, MGH-HS, SDS, and digital photographs of hairpulling sites. At the conclusion of the post-waitlist assessment, participants were given free access to 10 weeks of StopPulling.com and instructions for accessing the website. At this point, the participants in the waitlist condition had the same opportunity as participants in the immediate treatment condition to engage in StopPulling.com's self-help program and record self-monitoring information through the website. Participants received another brief phone check-in 5 weeks after the post-waitlist assessment. This phone check-in served as a safety precaution to identify any participants whose TTM symptoms had significantly worsened during the first step of treatment. (Only one participant experienced such an increase in hairpulling symptoms and was immediately advanced to in-person therapy.) After the 10 weeks of StopPulling.com, participants in the waitlist condition returned for another in-person assessment—the post-step 1 assessment, which included the PITS, MGH-HS, SDS, and digital photographs of hairpulling sites.

RESULTS

Sample Characterization

       The mean age of participants was 33.18 years (SD = 10.87). The sample consisted of 57

(95%) female and 3 (5%) male participants. Participants were mostly Caucasian (75%), followed

by African-American (17%), Asian (3%), Middle Eastern (3%), and Pacific Islander (2%).

Participants were generally highly educated, with 82% having at least completed college and

37% having completed graduate school. At baseline, participants in the current study had a mean

score of 16.92 (SD = 3.72) on the MGH-HPS and a mean score of 23.82 (SD = 4.49) on the

PITS. This was similar to the TTM severity of other samples in previous research (Crosby,

Dehlin, Mitchell, & Twohig, 2012; Keuthen et al., 2012; Diefenbach et al., 2005). Descriptive

statistics for measures of TTM severity and impairment are presented in Tables 2 and 3.

Table 2
Descriptive Statistics of TTM Severity and Impairment

	Immediate Treatment		Waitlist	
	Baseline	10 Weeks	Baseline	10 Weeks
MGH-HPS	17.07 (3.37)	14.78 (4.48)	16.77 (4.08)	15.40 (4.34)
PITS	24.27 (5.15)	20.75 (6.39)	23.37 (3.76)	21.90 (4.63)
Alopecia	5.04 (1.49)	4.73 (1.73)	5.22 (1.56)	5.00 (1.69)
SDS	7.87 (6.30)	6.46 (5.59)	9.03 (6.52)	8.00 (6.36)

Note. MGH-HPS = Massachusetts General Hospital Hairpulling Scale; PITS =
Psychiatric Institute Trichotillomania Scale; SDS = Sheehan Disability Scales. Data are
presented as mean (SD). At baseline: *n* = 60 for MGH-HPS and PITS; *n* = 59 for SDS; *n*
= 53 for Alopecia. At 10 weeks: *n* = 57 for MGH-HPS and SDS; *n* = 58 for PITS; *n* = 52
for Alopecia.

Table 3

Full Sample Descriptive Statistics of TTM Severity and Impairment

	Baseline	Post-Step 1
MGH-HPS	16.92 (3.72)	15.64 (4.65)
PITS	23.82 (4.49)	21.00 (5.75)
Alopecia	5.12 (1.51)	4.83 (1.75)
SDS	8.44 (6.38)	7.11 (6.48)

Note. MGH-HPS = Massachusetts General Hospital Hairpulling Scale; PITS = Psychiatric Institute Trichotillomania Scale; SDS = Sheehan Disability Scales. Data are presented as mean (SD). At baseline: $n = 60$ for MGH-HPS and PITS; $n = 59$ for SDS; $n = 53$ for Alopecia. At post-step 1: $n = 53$ for MGH-HPS and SDS; $n = 54$ for PITS; $n = 48$ for Alopecia.

Descriptive statistics for modality-strategy match scores are presented in Table 4. It should be noted that modality-strategy match scores were calculated using only data from participants who recorded self-monitoring data during the second module of StopPulling.com ($n = 27$). Data was used only from participants who recorded self-monitoring data during the second module of StopPulling.com because these were the only participants who had been provided treatment strategy recommendations. On average, participants applied treatment strategies consistent with active hairpulling modalities only 10% of the time. This was remarkably lower than expected, and is important to keep in mind when considering other analyses that incorporate the modality-strategy match scores.

Table 4

Full Sample Descriptive Statistics of Modality-Strategy Match Scores

	n	Mean (SD)
Sensory Match Score	23	4.44 (10.29)
Cognitive Match Score	25	11.79 (22.57)
Affective Match Score	27	4.05 (8.98)
Motoric Match Score	27	25.89 (27.69)
Environmental Match Score	27	6.79 (11.37)
Average Match Score	27	10.42 (7.39)

Note. Each modality-strategy match score ranges from 0 to 100, with higher numbers indicating more consistent use of treatment strategies that match the participant's hairpulling modalities.

Among these 27 participants, the frequency of each modality is presented in Table 5. However, it is important to note that it was incredibly rare for participants to record a hairpulling episode in which only one modality was present. In fact, 74% of participants reported that all five modalities were present in a single episode at least once. It is also worth noting that all episodes recorded involved the environmental modality. Table 6 shows the extent to which modalities overlapped among the current study's participants.

Table 5

Mean Number of Episodes Involving Each Hairpulling Modality (n = 27)

	Mean (SD)
Environmental Modality	20.44 (16.03)
Cognitive Modality	16.56 (14.48)
Affective Modality	17.81 (13.80)
Sensory Modality	6.52 (8.24)
Motoric Modality	19.22 (15.85)

Table 6

Percentage Of Participants Who Reported Co-occurring Modalities At Least Once (n = 27)

	%
All Five Modalities	74
Environmental, Cognitive, Affective, Motoric	63
Environmental, Affective, Motoric	59
Environmental, Sensory, Affective, Motoric	44
Environmental, Cognitive, Motoric	26
Environmental, Cognitive, Affective	26
Environmental, Motoric	26
Environmental, Sensory, Cognitive, Motoric	19
Environmental, Affective	15
Environmental, Sensory, Motoric	7
Environmental, Sensory, Affective	4
Environmental, Cognitive	4
Environmental only	4

Primary Analyses

It was predicted that decrease in TTM severity would be significantly greater after ten weeks of StopPulling.com than after ten weeks of the waitlist condition. A series of 2 (time) x 2 (group) repeated measures analyses of variance (ANOVAs) was used to test this hypothesis. Following the multi-method approach to the assessment of TTM severity, three separate repeated measures ANOVAs were conducted, with each of the three outcome measures—MGH-HPS, PITS, and alopecia rating—serving as the dependent variable. There were significant effects of time on MGH-HPS total scores (F (1, 55) = 14.93, $p < .001$, $d = 0.52$) and PITS total scores (F (1, 56) = 22.60, $p < .001$, $d = 0.64$); however, there was no significant effect of time on alopecia ratings (F (1, 46) = 1.44, $p = .236$). In general, participants experienced greater symptom reduction following ten weeks of StopPulling.com compared to ten weeks of the waitlist condition; however, these findings were not significant. There were no significant interactions

between time and treatment condition (MGH-HPS, $F (1, 55) = .96$, $p = .331$; PITS, $F (1, 56) =$ 3.71, $p = .059$; alopecia, $F (1, 46) = .81$, $p = .373$).

A 2 (group) x 2 (time) repeated measures ANOVA was also conducted to test whether reduction in functional impairment was significantly greater after ten weeks of access to StopPulling.com than after ten weeks of the waitlist condition. There was a significant effect of time on SDS total scores ($F (1, 55) = 4.82$, $p = .032$, $d = 0.30$), indicating a significant reduction in disability following ten weeks of participation in the current study. However, there was no significant interaction between time and treatment condition ($F (1, 55) = .09$, $p = .768$).

Exploratory Analyses

To test whether participants with higher modality-strategy match scores experienced greater reduction in TTM severity following ten weeks of access to StopPulling.com, correlation analyses were conducted among average modality-strategy match score and TTM severity change variables, using only data from participants who recorded self-monitoring data during the second module of StopPulling.com ($n = 27$). A technique previously used by Woods, Wetterneck, et al. (2006) was applied to create the change variables for each of the outcome measures of TTM severity. Change variables represent the percentage of reduction in TTM severity from baseline to post-step 1 assessment, and were calculated for MGH-HPS, PITS, and Alopecia.[1] It was expected that the change variables would correlate positively with modality-strategy match scores, and thus indicate a relationship between modality-consistent strategy use and greater symptom reduction. Unexpectedly, there were no significant correlations between

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[1] For example, the change variable was calculated for MGH-HPS by applying the following equation: ([baseline MGH – post-step 1 MGH] / baseline MGH) * 100

average modality-strategy match score and MGH-HPS change (rho = -.003, p = .988), PITS change (rho = .21, p = .286), or Alopecia change (rho = .17, p = .437).

A correlation analysis was also conducted between average modality-strategy match score and an impairment change variable, using only data from participants who recorded self-monitoring data during the second module of StopPulling.com. This change variable represents the percentage of reduction in impairment from baseline to post-step 1 assessment, and was calculated for SDS. There was no significant correlation between average modality-strategy match score and SDS change (rho = .26, p = .195).

DISCUSSION

The primary purpose of the current study was to conduct the first randomized controlled trial of StopPulling.com. It was expected that participants would experience significantly greater decreases in TTM severity and associated functional impairment after ten weeks of StopPulling.com than after ten weeks of a waitlist condition. Following ten weeks of StopPulling.com, significant reductions in TTM severity were found as measured by the MGH-HPS and the PITS. Significant reduction in associated functional impairment, as measured by the SDS, was also found following ten weeks of StopPulling.com. However, reduction in TTM severity was not significant as measured by alopecia ratings.

In understanding the absence of an effect of time on TTM severity, as measured by alopecia ratings, it is important to consider that not all participants in the current study provided consent to have digital photographs taken of their hairpulling areas. Thus, analyses that involved alopecia ratings utilized a somewhat smaller sample size ($n = 53$). It is also important to consider the limitations of using digital photographs to measure TTM severity. Photographs were only taken of hairpulling sites that were easily seen (e.g., scalp, arms, facial hair, eyebrows, and eyelashes). No photographs were taken of private areas (e.g., pubic hair). Thus, digital photographs may not have provided an adequate representation of general hairpulling. It is also possible for a photograph to give an inaccurate depiction of TTM severity. For example, an individual, who has especially thick hair, may pull a large number of hairs from the scalp with no noticeable change in appearance. However, an individual may pull a relatively small number of eyelashes and have absolutely no eyelashes remaining. Such a scenario would result in a higher alopecia rating for the individual who has pulled a small number of eyelashes, compared to the individual who has pulled a large number of scalp hairs. It should also be recognized that

30

different people experience hair regrowth at different rates. This could have also diminished the digital photographs' accurate representation of TTM severity.

Although participants experienced significant reductions in TTM severity and associated impairment over the course of ten weeks, there were no significant differences in these reductions between participants who received ten weeks of StopPulling.com and those who received ten weeks of the waitlist condition. Participants generally experienced greater reductions in TTM severity and associated impairment following ten weeks of StopPulling.com compared to ten weeks of the waitlist condition; however, these findings were not significant.

This may suggest that the improvements in TTM severity and associated impairment experienced by participants in the current study were due simply to the passing of time, rather than due to any direct benefit from StopPulling.com. It is possible that the baseline assessment increased participants' awareness of hairpulling and renewed their motivation to decrease hairpulling behavior, which could account for participants decrease in symptoms across both the immediate treatment and waitlist conditions. Future researchers might consider measuring hairpulling awareness and motivation for change at each assessment point to help determine what is contributing to decreases in hairpulling behavior over time. It is also possible that, regardless of participants' assignment to the waitlist condition or the immediate treatment condition, the personal attention received by all participants during the in-person assessments may have contributed to the general decrease in symptoms observed across conditions. It is likely that the in-person assessments involved some common factors (e.g., warmth of the assessor) that have been found to underlie a wide range of effective psychotherapy approaches (Najavits & Strupp, 1994; Reisner, 2005).

It is worth noting that the interaction between time and treatment condition did approach significance ($p = .059$) when TTM severity was measured by the PITS. In understanding why the interaction between time and treatment condition did approach significance when TTM severity was measured by the PITS, but did not approach significance when TTM severity was measured by the MGH-HPS, it may be helpful to consider that the information gathered through these measure is not identical. For example, The MGH-HPS specifically asks participants about the frequency and intensity of their hairpulling urges. The PITS does not gather any information about urges to pull. It is possible that participants who reduced their hairpulling behavior following access to StopPulling.com were still experiencing significant urges to pull. Such a scenario could certainly result in greater reductions in PITS total scores compared to the reductions in MGH-HPS total scores following access to StopPulling.com. To explore this potential explanation a repeated measures ANOVA was conducted using MGH-HPS totals calculated using only non-urge related items (i.e., item 4 + item 5 + item 6 + item 7). However, the interaction between time and treatment condition still was not significant, nor did it approach significance, when TTM severity was measured by the sum of the final four items of the MGH-HPS ($F (1, 55) = .56, p = .458$).

It is also important to consider the implications of finding an absence of a significant interaction between time and treatment condition in the current study. Although the findings of the current study support the conclusion that StopPulling.com is no more effective than the passage of time in reducing TTM severity, it is important to take into account the fact that participants in the current study were not required to actually use StopPulling.com. They were simply given free access to this service. Thirteen participants (22% of the current study's total sample) did not enter self-monitoring data on StopPulling.com at all during their ten weeks of

free access. On average, participants entered self-monitoring data on only 22.77 days ($SD =$ 24.40) out of a possible 70 days of free access. To explore the potential influence of StopPulling.com usage on the current study's findings, correlation analyses were conducted among TTM severity and impairment change variables and number of days participants entered self-monitoring data on StopPulling.com. The only significant correlation was between number of days and the SDS change variable ($rho = .29, p = .032$).

It is also important to recognize that the current study only had access to program usage information when participants actively recorded self-monitoring data on StopPulling.com. This may not account for any instances when participants utlilized the StopPulling.com website in other ways (e.g., reviewing psycheducational information, reviewing previous episode data, reviewing explanations of coping strategies, etc.). Just because a participant failed to record self-monitoring data does not mean that participant did not utilize the program at all.

Given the current sample's usage of StopPulling.com, the findings of the current study may not be sufficient to support a conclusion that optimal use of StopPulling.com is no more effective than the passage of time. Future research may gain a clearer picture of the effectiveness of optimal use of StopPulling.com by taking steps to increase program usage of participants.

The secondary purpose of the current study was to explore whether participants, who consistently employed treatment strategies that matched their active hairpulling modalities, experienced the greatest reductions in TTM severity and associated functional impairment. The purpose of this was to test the mechanism of change involved in StopPulling.com, and to examine whether this was consistent with the theoretical basis of the ComB model. Participants' tendency to apply treatment strategies that matched their active hairpulling modalities was represented by average modality-strategy match scores (see Appendix E for explanation of

calculations). It was predicted that participants with the highest modality-strategy match scores would experience the greatest reductions in TTM severity and associated impairment. Unexpectedly, modality-strategy match score was not significantly correlated with functional impairment nor any measures of TTM severity. Although this suggests that the consistency between strategy use and hairpulling modality has no bearing on the effectiveness of StopPulling.com, limitations of the current study should be considered when making such a determination.

It is important to note that the number of participants included in the correlation analyses ($n = 27$) was substantially fewer than the current study's total sample ($n = 60$). The purpose of this was to use only data from participants who recorded self-monitoring data during the second module of StopPulling.com because these were the only participants who had been provided treatment strategy recommendations. The relatively small sample size used in the correlation analyses may have influenced the absence of significant findings. For example, the correlation analysis conducted between average modality-strategy match score and SDS change (*rho* = .26, *p* = .210) had a medium effect size, but did not reach significance. This may indicate the need for a larger sample size to detect a significant relationship between impairment and average modality-strategy match score.

It is also important to consider that the average participant in the current study applied treatment strategies consistent with active hairpulling modalities only 10% of the time. Furthermore, the highest average modality-strategy match score achieved by participants in the current study was 25%. This was remarkably low. Correlation analyses may have failed to detect significant relationships because *none* of the current study's participants utilized StopPulling.com sufficiently. The intent behind the correlation analyses was to examine whether

participants experienced greater reductions in TTM severity and associated impairment if they mostly utilized strategies that were consistent with their hairpulling modalities. However, *none* of the participants could be accurately described as *mostly* utilizing strategies consistent with their hairpulling modalities because *none* of the participants applied consistent strategies even half of the time.

Although this provides valuable information about program usage in a realistic treatment setting (e.g., participants were not required to utilize StopPulling.com in any particular way, but were simply given the tools to utilize it optimally), the pattern of usage within the current study prevents any meaningful conclusions being drawn about the mechanism of change involved in StopPulling.com or the underlying ComB model of treatment.

It is possible that participants' consistent usage of strategies was deflated by calculating the average modality-strategy match score. To account for this, an overall consistency score was also calculated for each participant who recorded self-monitoring data during the second module of StopPulling.com. This overall consistency score represented the percentage of hairpulling episodes in which any coping strategy was applied that was consistent with any active hairpulling modality. For example, if a participant reported experiencing the cognitive and motoric modalities in a single hairpulling episode and reported applying a coping strategy that only targeted the motoric modality, that single hairpulling episode would be given a 100% overall consistency score. A mean overall consistency score of 92.43 (SD = 15.11) was found for participants who recorded self-monitoring data during the second module of StopPulling.com (n = 22). This was much higher than the average modality-strategy match score. However, when correlation analyses were conducted, no significant correlations were found between overall consistency score and MGH-HPS change (rho = -.177, p = .431), PITS change (rho = -.053, p =

.814), Alopecia change (*rho* = .028, *p* = .907), or SDS change (*rho* = .178, *p* = .428). Even when strategy usage was represented by participants' overall tendency to apply any strategy that was consistent with any active hairpulling modality, overall consistency still did not seem to be related to post-treatment changes in hairpulling symptoms or functional impairment.

Another possible limitation of calculating the average modality-strategy match score based on the self-monitoring entries on StopPulling.com is the nature of the self-monitoring entries. Participants were asked to record a self-monitoring entry every time they experienced an urge to pull, regardless of whether or not any hairs were actually pulled during that episode. If a high percentage of the recorded episodes did involve actual hairpulling, then the low average modality-strategy match scores may be accounted for by a sample of recorded episodes that represented mostly failed attempts to cope. Future research may benefit from collecting specific information about the outcome of each individual episode (e.g., pulled hair, did not pull hair, or interrupted hair pulling in progress).

It should also be acknowledged that StopPulling.com has several limitations in terms of its ability to translate the Comb model into a self-help program. For example, when an in-person therapist is faced with the presence of multiple modalities in a client's hairpulling pattern, the therapist can use his/her clinical judgment to select the modalities that are most common, most powerful, or most likely to be responsive to change as the focus when generating treatment strategies. StopPulling.com is not capable of utilizing the same clinical judgment, and thus can only make decisions based on frequency of hairpulling modalities. The list of strategies provided by StopPulling.com is also relatively narrow and does not encompass all strategies that may be helpful in reducing hairpulling behavior. Furthermore, the final phase of the ComB model consists of an evaluation of the effectiveness of treatment strategies, as well as the selection and

implementation of the next direction of treatment based on this evaluation. One of the options for the next direction of treatment is the consideration of modifications to current treatment strategies. StopPulling.com is not capable of making such subtle modifications. Future research may find greater value in investigating the mechanism of change involved in effective treatment of TTM by using in-person treatment based on the ComB model, rather than Internet-based self-help.

In general, hypotheses were not supported by findings, and there were a number of noteworthy limitations inherent in the current study. However, valuable information was obtained. Participants did demonstrate significant reduction in TTM severity following either ten weeks of access to StopPulling.com or ten weeks of a waitlist condition. Future research should further investigate the alternative factors that may influence such a change over time. There may also be value in replicating the current study with increased incentive for StopPulling.com utilization.

In considering alternative approaches to the investigation of self-help interventions based on the ComB model, future research may consider developing video-delivered self-help based on the ComB model. Using the same algorithms as StopPulling.com, but presenting modality-specific coping strategies via video recordings, may enhance users' understanding of optimal strategy use. Future researchers may also consider conducting a randomized controlled trial of ComB as an in-person treatment.

PSYCHIATRIC INSTITUTE TRICHOTILLOMANIA SCALE (PITS)

General Instructions:

First ask the participant the general hair-pulling history questions and fill in the answers.

Each of the following six measures should be scored on the accompanying score sheet.

The questions in **bold print** are to be asked of the participant as worded.

The additional questions in ***bold italics*** are optional questions to be used if more prodding seems necessary to adequately score the item. The interviewer may also ask any additional questions if it is felt that more information is still required to score the item.

Introductory Interview (Hair-Pulling History)

A. How old were you when your hair pulling first started? _____

B. Have you had it ever since then or has it gone away and come back?

☐ Has remained constantly   ☐ Has gone away and come back

(If gone away and come back)
Since this problem began, would you say this has been with you more   than half the time?

☐ Yes   ☐ No

(If unclear) **Since it started, has it ever gone completely away for 2 weeks?**

☐ Yes   ☐ No

What is the longest period that it has gone away? _____

How long has this current period of hair pulling been going on? _____

C. Has the hair pulling always been from the same part(s) of the body, or have the sites shifted around?

☐ Yes   ☐ No

List sites: _____

_____

_____

D. (If hair loss is not apparent) **Have you done things to hide or disguise the hair loss, like brushing your hair a special way, wearing hats or wigs, or anything else?**

(Describe): _____

_____

_____

1) Sites

(The score for this item should be based on both interview and direct inspection. In order to orient the interviewer to the scope of the problem, these questions should be asked first. However, it is recommended that direct examination be conducted at the end of the interview. Scoring this item should be done after the direct exam. However, the following questions should be asked because of the relative inaccessibility of some anatomic sites in the course of a standard interview and because some individuals may hide hair pulling form certain sites, but not others.)

From what part or parts of your body do you pull hair?

Do you ever pull hairs on your arms or legs or other places like your torso or from pubic areas?

Any other places?

Some people pull hair from areas they find embarrassing to talk about. Do you feel that way?

      If YES, *Which sites do you find embarrassing to discuss?*

No sites	1 nonscalp site	1 scalp site	2 nonscalp sites	2 sites including scalp	3 sites	4 sites	5 or more sites
0	1	2	3	4	5	6	7

2) Duration

The subject should be encouraged to provide an answer in minutes or hours.

On an average day this past week, how much time would you say you spent pulling your hair or thinking about it? Include time you spent thinking about pulling hair, even if you were not actually pulling.

If the subject has difficulty answering, or does not answer quantitatively…
Is it closer to a few minutes or a few hours?

Would you say: Is it more or less than _____ hours [minutes] per day?

No time	≤ 5 minutes per day	> 5 minutes but ≤ 15 minutes	> 15 minutes but ≤ 30 minutes	> 30 minutes but ≤ 1 hour	> I hour but ≤ 2 hours	> 2 hours but ≤ 3 hours	> 3 hours
0	1	2	3	4	5	6	7

3) Resistance

When the urge to pull is present, are you ever able to resist?

How much of the time can you resist the urge and not pull?

Some of the time? A lot of the time?

More than half the time? Less than half the time?

No urge	Always able to resist	Almost always able to resist	Able to resist ¾ to almost always	Able to resist ½ to ¾ the time	Able to resist ¼ to ½ the time	Rarely able to resist	Never able to resist
0	1	2	3	4	5	6	7

4) Interference

Does it keep you from doing anything? For example, is there anything you avoid doing, even just sometimes, because of your hair pulling?

Does it affect your work (studies, etc.)?

What about social things? Does it ever affect things you do socially? Does it have any impact on your dating habits (or your relationship with your significant other)?

If the individual avoids any activities because of hair pulling-related concerns…
How often would you say this happens that you might avoid…? Frequently? Only sometimes?

No interference in functioning	Occasionally avoids 1 or 2 activities, creating no or minor inconvenience with (e.g., avoids swimming)	Frequently avoids 1 or more minor activities, creating some inconvenience	Occasionally avoids 1 major life activity (such as work or dating)	Occasionally avoids more than 1 major activity (such as work or major social functions)	Frequently avoids 1 major activity such as work or major social functions (e.g., dating)	Frequently avoids more than 1 major activity such as work and major social functions	Almost always avoids 1or more major activities such as work and major social functions
0	1	2	3	4	5	6	7

5) Distress

Is pulling your hair something that you think about much?

Does it bother you that you do this?

Does it bother you a lot?

What do you worry about?

Are you ever worried that this problem will keep you from doing important things in life, or will make it harder?

Do you worry that it will have any effect on your work (studies, etc.)?

What about things like dating or marriage—are you concerned that your hair pulling will affect those things?

No distress or thoughts about it	Occasionally thinks about it, but isn't very concerned	Worries occasionally about hair pulling and/or its consequences	Worries daily about hair pulling, but distress is only mild	Worries daily about hair pulling, and distress is moderately severe	Worries occasionally that hair pulling may have major impact on life course (e.g., fears they may never be able to marry)	Worries frequently that hair pulling may have major impact on life course (e.g., fears they may never be able to marry)	Has daily severe distress regarding hair pulling or its consequences
0	1	2	3	4	5	6	7

6) Severity

The score for this item should be based on direct inspection. If several areas are involved, the scores should be determined on the basis of the most severely affected area.

If hair pulling is present in a region that cannot be reasonably inspected in the course of the interview, then scores should be based on what is available to observation.

No loss	Negligible loss (can't see loss even if site pointed out)	Mild loss (seen only if area pointed out)	Moderate loss (loss visible to observer upon inspection) (e.g., thin spots on scalp)	Loss of 50% of hair of brows or lashes, or nearly bald spots on scalp or body part	Loss of 75% of hair of brows or lashes, or nearly bald spots on scalp or body part	Loss of almost all hair of brows or lashes, or large areas of baldness on scalp or body part	Total loss of hair of brows or lashes or almost total loss of scalp hair or hair on other body part
0	1	2	3	4	5	6	7

THE MASSACHUSETTS GENERAL HOSPITAL HAIRPULLING SCALE (MGH-HS)

Instructions: For each question, pick the one statement in that group which best describes your behaviors and/or feelings over the past week. If you have been having ups and downs, try to estimate an average for the past week. Be sure to read all the statements in each group before making your choice.

For the next three questions, rate only the urges to pull your hair.

1. **Frequency of urges.** On an average day, how often did you feel the urge to pull your hair?
   - 0   This week I felt no urges to pull my hair.
   - 1   This week I felt an **occasional** urge to pull my hair.
   - 2   This week I felt an urge to pull my hair **often**.
   - 3   This week I felt an urge to pull my hair **very often.**
   - 4   This week I felt **near constant** urges to pull my hair.

2. **Intensity of urges.** On an average day, how intense or "strong" were the urges to pull your hair?
   - 0   This week I did not feel any urges to pull my hair.
   - 1   This week I felt **mild** urges to pull my hair.
   - 2   This week I felt **moderate** urges to pull my hair.
   - 3   This week I felt **severe** urges to pull my hair.
   - 4   This week I felt **extreme** urges to pull my hair.

3. **Ability to control the urges.** On an average day, how much control do you have over the urges to pull your hair?
   - 0   This week I could **always** control the urges, or I did not feel any urges to pull my hair.
   - 1   This week I was able to distract myself from the urges to pull my hair **most of the time.**
   - 2   This week I was able to distract myself from the urges to pull my hair **some of the time.**
   - 3   This week I was able to distract myself from the urges to pull my hair **rarely.**
   - 4   This week I was **never** able to distract myself from the urges to pull my hair.

For the next three questions, rate only the actual hairpulling.

4. **Frequency of hairpulling.** On an average day, how often did you actually pull your hair?
   - 0   This week I did not pull my hair.
   - 1   This week I pulled my hair **occasionally.**
   - 2   This week I pulled my hair **often.**
   - 3   This week I pulled my hair **very often.**
   - 4   This week I pulled my hair so often it felt like I was **always** doing it.

5. **Attempts to resist hairpulling.** On an average day, how often did you make an attempt to stop yourself from actually pulling your hair?

0	This week I felt no urges to pull my hair.
1	This week I tried to resist the urge to pull my hair **almost all of the time.**
2	This week I tried to resist the urge to pull my hair **some of the time.**
3	This week I tried to resist the urge to pull my hair **rarely**.
4	This week I **never** tried to resist the urge to pull my hair.

6. **Control over hairpulling.** On an average day, how often were you successful at actually stopping yourself from pulling your hair?

0	This week I did not pull my hair.
1	This week I was able to resist pulling my hair **almost all of the time.**
2	This week I was able to resist pulling my hair **most of the time.**
3	This week I was able to resist pulling my hair **some of the time.**
4	This week I was **rarely** able to resist pulling my hair.

For the last question, rate the consequences of your hairpulling.

7. **Associated distress.** Hairpulling can make some people feel moody, "on edge," or sad. During the past week, how uncomfortable did your hairpulling make you feel?

0	This week I did not feel uncomfortable about my hairpulling.
1	This week I felt **vaguely uncomfortable** about my hairpulling.
2	This week I felt **noticeably uncomfortable** about my hairpulling.
3	This week I felt **significantly uncomfortable** about my hairpulling.
4	This week I felt **intensely uncomfortable** about my hairpulling.

APPENDIX C

ALOPECIA PHOTOGRAPH RATING

Circle the number below that best describes the photograph:

1	2	3	4	5	6	7
Normal		Minimum		Moderate		Severe
No evidence of hair pulling		*Little evidence of pulling*		*Bald spots present but concealable*		*Large bald spots that are difficult to conceal*

SHEEHAN DISABILITY SCALE (SDS)

Instructions - Please mark ONE box for each scale.

DISABILITY SCALES

Work/School
The symptoms have disrupted your work/school work:

Not at all — Mildly — Moderately — Markedly — Extremely

Social Life
The symptoms have disrupted your social life:

Not at all — Mildly — Moderately — Markedly — Extremely

Family Life/Home Responsibilities
The symptoms have disrupted your family life/home responsibilities:

Not at all — Mildly — Moderately — Markedly — Extremely

MODALITY-STRATEGY MATCH SCORES

Environmental Modality

Number of hairpulling episodes, in which an environmental modality was reported: __(EM)_____

Number of these episodes, in which an environmental strategy was applied: ____(ES)_____

Match Score: ____(ES) / (EM)____ = ____(raw match)____ x 100 = __Transformed E-Match__

Cognitive Modality

Number of hairpulling episodes, in which a cognitive modality was reported: __(CM)_____

Number of these episodes, in which a cognitive strategy was applied: ____(CS)_____

Match Score: ____(CS) / (CM)____ = ____(raw match)____ x 100 = __Transformed C-Match__

Affective Modality

Number of hairpulling episodes, in which an affective modality was reported: __(AM)_____

Number of these episodes, in which an affective strategy was applied: ____(AS)_____

Match Score: ____(AS) / (AM)____ = ____(raw match)____ x 100 = __Transformed A-Match__

Sensory Modality

Number of hairpulling episodes, in which a sensory modality was reported: __(SM)_____

Number of these episodes, in which a sensory strategy was applied: ____(SS)_____

Match Score: ____(SS) / (SM)____ = ____(raw match)____ x 100 = __Transformed S-Match__

Motoric Modality

Number of hairpulling episodes, in which a motoric modality was reported: __(MM)_____

Number of these episodes, in which a motoric strategy was applied: ____(MS)_____

Match Score: ____(MS) / (MM)____ = ____(raw match)____ x 100 = __Transformed M-Match_

AVERAGE MODALITY-STRATEGY MATCH SCORE: [(Transformed E-Match) + (Transformed C-Match) + (Transformed A-Match) + (Transformed S-Match) + (Transformed M-Match)] / 5

APPENDIX F

TREATMENT STRATEGIES PROVIDED BY STOPPULLING.COM

Strategy 1—Bandaids/Gloves
Wearing bandaids on the tips of the fingers that you use to pull can be a very effective tool in preventing an episode. There are bandaids made specifically for fingertips called "fingertip" or "butterfly." The bandaids take away your ability to feel the hair, which interferes with searching for a particular hair, stroking your hair, and playing with the hair after it is pulled. It is recommended that you always wear the bandaids in your high risk situation. The same is true for gloves. Because gloves are sometimes hard to wear in the daytime because of a need to perform daily functions, they are often recommended for people who pull at night while in bed.

Strategy 2—Hand Toys
Hand toys are toys, games, or crafts that are used to keep your hands busy. Go to the toy or craft store and play with many different things to see what your hands like. Many people use "squeezy" or "koosh" balls during their high risk situations to help them keep their hands busy. Other options are Play Dough, bottle brushes, clay, slime, or Gooze which have a different texture to them. Some people prefer to take up crochet or painting while others prefer to play hand held video games. There are many different options for you in the area of hand toys, so be creative and choose things that you like. Other ideas are to paint or file your nails. This not only keeps your hands busy for a while, but also is a way of taking care or yourself.

Strategy 3—Fist Clenching
Fist clenching is a behavioral tool that "competes" with the urge to pull. It is one of the most important of all of the coping strategies because it can be used anywhere, without any props, and because with practice, it can become an almost automatic response to having a hair pulling urge. As a result, you need to practice using the fist clenching AS OFTEN AS YOU CAN. The more frequently you practice, the more automatically your body will go to the fist clenching when you have an urge to pull. What is fist clenching? When you are having an urge, straighten your arms and make your hands into fists, clenching gently for 3 minutes. The arm straightening and clenching not only prevent you from pulling, but also provide a tactile stimulation to the fingertips. While you are clenching, take deep breaths and try to relax. Clenching can be modified for use in a variety of situations. If you are driving, clench the steering wheel; if you are reading, clench the sides of the book; if you are writing, you can clench one hand and write with the other.

Strategy 4—Keep hands away from face/hair
As you probably have learned through the Assessment Module, your hair pulling usually involves a sequence of individual behaviors, many of which occur before any hair is pulled. For example, it is common to stroke the face and/or hair before pulling, searching for a "good" hair to pull. Once this has occurred and the hair has been identified, it is much more difficult to stop the episode from happening. But, if you can avoid the preceding behaviors (face touching, hair playing) it is much easier to avoid the episode altogether. It takes a great deal of effort and concentration to keep your hands away from your hair, but it can be done! Many people have

found that wearing an Ace bandage on the elbow of the arm they use to pull makes it difficult for them to get their hand up to their head because they can't readily bend their elbow. Some people find that putting their hair up in a pony-tail helps to make the hair less accessible. Others use lotion or cream on their hands because they are less likely to touch their face or hair with lubricated hands. Still others find that if they wear mascara and/or eye shadow they are less likely to touch these areas. Be careful though, some people report that they only pull when they are wearing mascara. If you are one of these people, wearing mascara to stop touching your eyelashes is not a good solution. If you search for certain types of hair, like the coarse or kinky ones, try using V-05 hot oil treatment. Many people report that it makes their coarse hair softer, thus reducing the urges to pull.

Strategy 5—Relaxation
Many people report that they pull their hair when they are stressed out, nervous, tense, anxious or angry. They talk about how pulling hair seems to have a soothing or calming effect on them. Relaxation skills can be used when you are feeling like you need some stress relief. There are several different ways to relax presented here. Try each of them and use what works best for you. Deep Breathing Technique: Most people do not take long, deep breaths except when they are asleep. When people get stressed out, they tend to take even shorter, more shallow breaths. Research shows that a very quick way to calm your body down is to use the Deep Breathing Technique. When you are feeling stressed out and like you may be at risk to pull, or if you feel like pulling to relieve stress, start to focus on your breathing. Breathe in slowly through your nose for a count of 4-5. Next, exhale through your mouth for a count of 4-5. Repeat this process 10 times. Muscle Relaxation Technique: Oftentimes we are not aware of the muscle tension that we hold at any given moment. Take a moment right now to scan your body and notice which muscles are tense. Letting go of tension in your body will lead to feelings of relaxation. When you are feeling stressed out and like you may be at risk to pull, or if you feel like pulling to relieve stress, try using the muscle relaxation technique. First, find a comfortable position either sitting or lying down. If possible, close your eyes (obviously do not close your eyes if you are driving), take a few deep breaths, and begin to scan your body starting at the top of your head. Notice if any muscles are tense or tight and if they are, focus on letting go of this tension and relaxing these muscles. Imagine a tightly wound rope beginning to unwind. Move down your body checking your jaw muscles, the muscles in your neck, shoulders, back, arms, hands, stomach, legs and feet. Stop yourself at any point you find tension and take a few moments to relax that muscle. Imagine that you are in a beautiful and peaceful place like the beach or near a waterfall. Take as much time as you like to complete this process as it should be a very pleasurable exercise. With practice, you will become more aware of your body and where you tend to hold tension. Over time, it will get easier for you to recognize when your muscles are tense, as well as easier to release the tension. Exercise: Research shows that one of the most effective ways to reduce stress and anxiety is to engage in regular exercise. If you do not already exercise several times a week, try incorporating several new activities into your life. Be creative and choose activities that you enjoy like biking, roller blading, or hiking. You will be much more successful at maintaining an exercise regime if you enjoy what you are doing. Many people report that stretching exercise such as yoga is especially helpful for stress because of the deep breathing that is encouraged. Click the button below to play or download a relaxation exercise.

Use it daily to help you to relax, or use it when you are feeling the urge to pull. Most importantly, enjoy!

Strategy 6—Barriers
Barriers are tools that block you from pulling like hats, caps, scarves, bandanas, eyeglasses, or eyelid masks (can be found at the Body Shop). Some people need the barrier to help them realize that they are having an urge. When they go to pull, they get stopped by the hat (or other barrier). Wear a barrier whenever you are in a high risk situation, for example keep a cap in the car or by the phone if those are difficult times for you.

Strategy 7—Pleasurable Activity
A pleasurable activity is something that you enjoy doing such as a craft, going for a walk, taking a hot bath, playing or listening to music, or any personal hobby. Many people report that they enjoy some aspect of hair pulling or that they pull when they are bored. Substituting a pleasurable activity for hair pulling can be helpful in combating urges. The object is to stop what you are doing when you have an urge to pull, and begin your pleasurable activity.

Strategy 8—Change Posture
Many times hair pulling is made easier by your posture. For example, people who pull in the car often rest their elbow on the door ledge for support. Changing their posture (in this case taking their elbow off the ledge and putting 2 hands on the wheel) can make pulling more inconvenient. Common postures that aid pulling are listed followed by how to change the posture to make it more difficult to pull. Posture: Sitting on the sofa with elbow propped up on pillow or on side of sofa. Solution: Sit in the middle of the sofa and move pillows away. Some people even put a box over the part of the sofa where they are accustomed to sitting, to remind themselves not to sit there. Posture: Sitting at my desk/table with elbow on table and hand in hair, eyelashes or eyebrows. Solution: Move elbow off table. Posture: Lying in bed with hand in hair. Solution: Move arms to your side.

Strategy 9—Change Activity
Hair pulling is often associated with certain activities. Many times it is possible to overcome an urge by simply stopping the "hair pulling activity." For example, if you pull when you talk on the phone and you feel an urge coming on, you would tell the person you have to go and hang up. Read through the following list of common "hair pulling activities" and see how these apply to you. Activity: Reading. Solution: Close the book. Activity: Attempting sleep. Solution: Get up and try to fall asleep again later. Activity: Working on the computer. Solution: Leave the computer, turn it off. Activity: Studying/concentrating. Solution: Take a break from your studies for 20-30 minutes. Activity: Watching TV. Solution: Turn off the TV and go outside or to another room. Activity: Looking in the bathroom mirror. Solution: Leave the bathroom. Activity: Cooking. Solution: Leave the kitchen if you can, ask someone to help you finish or finish later. Activity: Talking on the phone. Solution: Tell the person you are talking to that you have to go. Activity: Sitting on the toilet. Solution: Get up and try again later. Activity: Driving. Solution: Pull over or drive directly to your destination. Do not sit in the car before or after you drive and dally around, only sit in the car if you are driving. Activity: Making decisions. Solution: Decide to table your decision until later, tell yourself that it is OK to wait to make the decision until you

are in a safer place, maybe when you are around people or have other coping strategies in place.

Strategy 10—Avoid Mirrors
For some people hair pulling is triggered by seeing their hair in the mirror, whether it be a stray hair, or one that is curly, coarse, or out of place. Looking in the mirror to find a hair is common for eyelash and eyebrow pullers, as well as scalp and other facial hair pullers. If this is true for you, it makes sense to avoid mirrors until you feel stronger about controlling your urges. This can be done by putting a ribbon or tape across your bathroom, 3-4 feet from the mirror, reminding you not to get any closer than that. For mirrors that are hard to avoid, such as car visor mirrors, you can put tape over the mirror for several weeks. If you find that it is too hard to keep your distance from mirrors, try covering the mirror completely with either a sheet or cheesecloth until you are better at controlling your urges.

Strategy 11—Avoid TV
A common hair pulling situation for people with trich is while watching TV. Sometimes it is too difficult to reduce urges with other coping strategies while watching TV and more direct measures must be taken. If one of your high risk situations is "Watching TV" try not watching TV for several weeks, or until you feel stronger at controlling your urges. Ideally, you could avoid watching any TV during this time. Some people, however, are able to reduce TV watching to certain times of the day when they have a low risk of pulling. For example, if your high risk time is from 6-12pm, limit your TV time to morning time only.

Strategy 12—Throw away hairpulling tools
If you use tools such as tweezers, pliers, etc. to assist you in pulling, it is time to get rid of them. You can live a successful and productive life without these tools and having access to them is too risky. If you don't want to throw them away permanently, give them to a friend or family member that does not live in your home. Do not ask a spouse or family member to "hide" them for you, as you will end up spending time "hunting" for them around the house. Do not allow these tools back into your home until you have been in the Maintenance Phase for one year.

Strategy 13—Brush hair/Wash hair
Many people report that hair pulling is triggered by physical sensations on the skin such as tingling, itching, burning, pain, sensitivity, or pressure. If this is the case for you, try brushing or washing your hair when you experience these bothersome sensations. Brushing the hair and the scalp can relieve unpleasant physical sensations and can have a relaxing, soothing effect. Washing the hair, massaging the scalp, and using conditioner have a similar result. In addition, some people report that pulling urges decrease when their hair is wet or is sprayed with hair spray. If you find that you are pulling because of a physical sensation that the pulling satisfies, try using different items that can help you meet your sensory needs. For example, rubbing a make up brush alone your face or mouth can simulate the sensation of hair against your skin. For eyelash pullers, buy some "eyescrub" at the drug store for relief of itchy eyes. Other ideas are to use a loofah sponge on your skin in the shower, rub a silky swatch of material between your fingers, or rub a bottle brush along your skin of it likes the prickly sensation.

Strategy 14—Chew Gum

For those people who bite the "root" off of the hair after it is pulled or who eat the pulled hair, try chewing gum during your high risk situations. People who engage in hair biting or eating report that chewing gum helps them to limit this behavior. For many people, hair pulling is more about the hair biting or eating, than it is about the pulling itself. Removing the biting and/or eating can, therefore, remove the reason for pulling in the first place. Other variations to Chewing gum include: Sucking on hard candy like a lifesaver, chewing/eating alfalfa sprouts, eating raw or cooked spaghetti, using or playing with dental floss.

Strategy 15—Ask for help

Sometimes it is important to just ask a friend, spouse, or family member for help. Help may be in the form of a statement about keeping your hands away from your face or head. Some people even make up "code words" that their loved ones use to help them remember to stop pulling like "be careful." Others would rather be redirected by being handed a "hand toy." Help can also take a more direct form. Sometimes when you are in a situation where you feel stuck and don't think you can stop pulling, you can call a loved one (either in person or on the phone) to help you. Sometimes hearing that someone supports you and will stop what they are doing to help you can be very powerful. Be careful to describe to your loved one what behaviors and words will be helpful and what will not. Be very specific when you ask them for help by telling them specific phrases that will be helpful to you. Sometimes people think that they are helping, but actually end up causing frustration and unwanted tension, which can lead to more pulling.

Strategy 16—Thought Busting

Thoughts specific to hair pulling: Many people have beliefs or thoughts about pulling before they pull, while they are pulling, as well as after they have an episode. Beliefs about hair pulling may include: "If I pull the hair out of this pimple it will drain and heal faster," or "If I pull the coarse (or white) hair out, the new ones will grow back softer (or my natural color)." These beliefs are patently untrue. In fact, pulling the hair put of a pimple can further irritate the skin and cause it to heal more slowly. In addition, pulling the coarse or white hairs out causes them to grow back even coarser and they will continue to grow in white, unless left alone. Addressing common beliefs about hair pulling can help to change the motivation for the behavior. Examples of statements that may help you change your beliefs about hair pulling are as follows: "Pulling the hair out of this pimple/blemish will not help it heal and might make it worse!" or "If I pull this coarse/white hair out it will make one grow back ever coarser/whiter...I better leave it in." Activity: Statements that help you change your beliefs on a 3X5 inch note card. Pull this card out and read it when you find yourself buying into these faulty beliefs. Typical thoughts before an episode are permission giving thoughts. Permission giving thoughts are thoughts that talk you into an episode such as: "I deserve it," "I will only pull a few," "I might as well pull them all out and start over," "This hair will bother me until I pull it out," "I can't concentrate without pulling," "I need to pull these eyelashes out to make it match the other," and "I will feel less tense after pulling." They are essentially thoughts that give you permission to pull. Other thoughts about hair pulling occur during or after an episode and may include angry thoughts for having pulled, or thoughts about the damage you may have inflicted during the episode. Thoughts like this may be: "I am a failure, I will never be able to stop," "I have no will power at all," "I can't believe I pulled this much, I won't be able to cover this up," "My eyelashes are

completely gone!" "This is the worst episode ever!" Permission giving thoughts: If you tend to give your self permission to pull, you must begin to argue with your thoughts. Instead of talking yourself into pulling, you must start to talk yourself OUT of pulling. Examples of this are as follows: "I don't deserve to pull, I deserve to have all of my hair back!" "I say I will only pull a few, but it never ends up that way…I need to avoid pulling any!" "This hair is bothering me, but if I do something else to take my mind off of it, I may forget about it. I need to change activities." "I can concentrate without pulling! Pulling actually distracts me from my activity…I may concentrate better by NOT pulling." "My eyelashes/eyebrows don't match, but at least I have some! Better to have some than to try to fix it and have few or none!" "Actually, I will feel worse after pulling. Pulling helps me feel better while it is happening, but in the end I end up stressed out about the damage I have caused to my hair." Activity: Write any thoughts that help you "argue" with your permission giving thoughts on a 3X5 inch note card. Pull this card out and read it when you find yourself giving permission to pull. Angry thoughts: If you tend to have angry thoughts and beat yourself up after an episode, you must start to encourage yourself. Examples of encouragement are as follows: "I am not a failure, I have been working very hard to decrease my pulling and I know that this is a very hard behavior to stop." "This is a process that takes time…if I keep working on it I will be successful." "I do have willpower, I have been working this program for weeks which takes a lot of effort and determination!" Activity: Write any encouraging thoughts that are specific to your angry thoughts on a 3X5 inch note card. Pull this card out and read it when you find yourself having angry thoughts. Thoughts about the damage: If you tend to focus on the damage you cause, try looking toward the future. Examples of ways to look toward the future are as follows: "OK, I pulled a lot and there is a bald area. The good news is that hair does grow back and I now have to chance to start over and to do better." "Today was a hard day…tomorrow I can get back to using my coping strategies and get back on track." "My eyelashes are completely gone, but they grow back pretty quickly. I can start to see progress in a few weeks if I get back on track." "Well, there is nothing I can do about the damage, but there is a lot I can do about pulling in the future! I need to review my coping strategies and get to work to do better next time." "I am going to take it one day at a time, tomorrow I will try to do better than I did today." Activity: Write any looking toward the future thoughts that are specific to your thoughts about the damage on a 3X5 inch note card. Pull this card out and read them when you find yourself having thoughts that focus on the damage hair pulling has caused.

Strategy 17—Thought Busting II
Thoughts specific to something else: All of us have thoughts that cause us to feel tense, angry, happy, or sad. Many people think these thoughts when an episode begins or while they are pulling. For example, you may have had a fight with a loved one and are thinking about the fight or how angry you are at that person. While you are thinking these thoughts, you may begin to pull. If you learn through Module I that you have thoughts specific to something else before, during, or after you pull, read the following section about busting these thoughts and reducing bad feelings. The way you think about events and experiences often has a significant impact on your feelings about them. The goal of this section is to help you learn to notice when your thoughts are not accurate and how to change them so that your bad feelings decrease. In order to change your thinking in ways that will improve your mood and possibly reduce your hair pulling, (these steps are based on those described in Stanley, Diefenbach, & Hopco (In Press), a

manual for the treatment of anxiety through cognitive behavioral techniques), you will REACT. The first step is to recognize the thoughts that lead to bad feelings. You already have begun to do this through your Daily Record. Take time here to go back and review your common thoughts that you identified during Module I. Make a list of these thoughts. Next step is to evaluate how realistic these thoughts are – often the thoughts we have are not realistic. For example, sometimes we misinterpret situations to mean that someone is mad at us when they really are not (e.g., your child/spouse/friend does not say "hello" to you one day – and you think they certainly must be upset with you for something you have done/not done – but actually, he/she has just had a hard a bad day and their mood is completely unrelated to you or your actions). Here it is useful to think about your thoughts as hypotheses or guesses rather than facts – then to take time to evaluate how realistic the thoughts are – to assess as best you can whether or not your thoughts are accurate. Sometimes they are – sometimes they are not. When they are not, the goal will be to change the thoughts to something more realistic, so that your negative mood will improve. To evaluate your thoughts and decide if they are realistic or not, first recognize the thought, then ask yourself a few questions: 1. ALL-OR-NONE THINKING - Am I thinking in an all-or-none way– e.g., either things are great or terrible, wonderful or horrible, completely positive or completely negative? Seeing the world this way can create negative mood. No room for "middle ground" (e.g., I'm good at some things, not so good at others). KEY WORDS – words that may help you to identify this way of thinking are "either X or Y" or "if not X then Y." Activity: Take time to identify this way of thinking in your own life. Make a list of all-or-none-thoughts that are common for you (e.g., if I make any mistake, then I am a failure). 2. SHOULD STATEMENTS - Does my thought include the word, "should"? Telling yourself that you or others "should" act a certain way – or thinking that things "should" turn out a specific way - often means that you have certain inflexible "rules" about how you and/or other people should act. In these cases you may not stop and think whether the "rule" makes sense in every case – sometimes it will, sometimes it won't. KEY WORDS – words to look for to identify should statements are "should," "ought," and "must." Activity: Take time to identify this way of thinking in your own life. Make a list of the should statements that are common for you, e.g., I should always be on time. 3. FOR SURES - Do I believe for sure that something bad will happen? Sometimes a negative event is possible, but not likely (e.g., I could have a car accident today, but it is not likely. Sometimes, you may find yourself overestimating the probability of danger, risk, or threat. If so, increased negative mood can result. KEY WORDS – key words to help identify "for sure" statements are "definite," "sure," "absolutely," "going to," and "will." Activity: Take time to identify this way of thinking in your own life. Make a list of the for sure statements that are common for you (e.g., my friend is going to hate me for saying that!). 4. MY FAULTS - Am I thinking something is my fault? If so, you may be accepting too much responsibility for situations over which you have no control. People with negative moods often blame themselves for past events and overestimate their ability to control future events (e.g., feeling responsible for your sister's mood). KEY WORDS – key words to help identify "my faults" are "if only I hadn't" or "if only I had." Activity: Take time to identify this way of thinking in your own life. Make a list of my fault statements that are common for you (e.g., if only I had been a better mother, my child would have been accepted at the college of his choice). 5. BIG DEALS - Am I making a big deal out of something that is not a big deal? People with negative mood sometimes get very upset about possible outcomes that are really very minor. For example, someone may get very upset about the possibility of being late for an appointment,

when being 10 minutes late really will not have a significant consequence. KEY WORDS - key words to identify big deals are extreme words like "terrible," "awful," and "horrible." Activity: Take time to identify this way of thinking in your own life. Make a list of the big deal statements that are common for you (e.g., my outfit looks terrible!). If after you evaluate your thought, you decide that it even a little unrealistic, try the following 3 steps. Identify an alternative thought - simply put, try to find another, more realistic way to think about the situation. Open your mind to other ways of thinking. Almost always there are alternatives to the thoughts you're having. This is NOT the same as simple "positive thinking" – instead, the goal is to replace an unrealistic thought with a more realistic one. There are some ways to decide what alternative thoughts might make sense, and these follow from the questions we have already discussed: you are thinking in an all-or-none way, try looking for some "middle ground," e.g, when you say to yourself, "Either, or . . . if not x, then y," try to think of an alternative way to view the situation that is somewhere in the middle. For example, if your thought is: If I make any mistake, then I am a failure, change it to: We all make mistakes at times, it does not make me a failure. If your thought includes the word, "should," or even "ought" or "must," try asking yourself, "Is this expectation realistic?" For example, in response to the thought: I should always be on time, change it to: I try to be on time, but sometimes things happen that I cannot control. If you believe that your worry will happen for sure, try to think more realistically about the actual chances that a negative event will occur, e.g., "How much do I believe that I will get fired?" If you are saying to yourself that something if my fault, when it is really out of your control, try blaming yourself less. Try to identify other factors that may be contributing to the situation. For example, in response to the statement: If only I had been a better mother, my child would have been accepted at the college of his choice, you might counter with "There are many reasons my son did not get into the college of his choice, most importantly his low grades." If you are making a big deal out of something that is not a really big deal, ask yourself "what if" your fear does come true. For example, you might ask yourself, "What if I am late for this appointment, what's the worst thing that could happen?" It is likely that you will find that even the worst case (i.e., you need to reschedule your appointment) is not really that big of a deal, and really not worth getting very anxious about. Another option is to use a coping statement – or a statement that you make to yourself that helps to decrease your bad feelings about certain situations. You can also think of it as a strategy for providing "instructions" to yourself. One example might be to say to yourself something like: "I can continue working even if I am stressed out." "Even if I don't do this perfectly, I can handle it well enough." "I have handled stressful situations like this before and done fine." "I pulled a few hairs out, this does not mean that I am a failure or that I need to keep pulling." "There are many things I can do to feel better besides pulling my hair." Use of coping statements may help you to manage stress more effectively -- or they may help you to look for a new way to perceive a stressful situation. The goal is not just to "look on the bright side of things" but to help you to be more realistic in your thoughts about situations and events. This type of self-talk can help you to perceive that some situations aren't really as bad as you expect them to be – and help you realize that you are in more control than you often perceive yourself to be. The major focus of coping statements is to remind you that you are in control. Another strategy that can be useful for controlling negative thoughts is "thought-stopping." The idea is to stop dwelling on negative thoughts by redirecting your attention to the things going on around you. One way to do this is to imagine a "big red stop sign" vividly in your mind, then to turn your attention to some activity that interests you, e.g., you may look around more closely at your

environment, what pictures are on the wall, what is the weather like today, etc. Or, you may get up and begin a project/activity that is fun for you (take a walk, call a friend, pet your dog). The idea here is that when thoughts are not productive or are creating negative mood, you can STOP the thoughts by a "self instruction" to stop followed immediately by a change of behavior or attention. This may seem very simple, as if it will not work. Try right now to practice using the stop sign and changing activity or attention and see how effective it can be in changing your thinking. Identify a recent stressful situation, and clarify what the stressful thoughts were. Then, close your eyes and conjure up those thoughts in your mind. Think about the thoughts for a brief period. Then, imagine the stop sign while saying STOP either aloud or in your head. Immediately open your eyes and divert your attention to what's going on in room – who's there, what are you doing, how light/dark it is, what is hanging on the walls, etc. If the thoughts return, try using the STOP again.

APPENDIX G

SELF-MONITORING ON STOPPULLING.COM:

ACTIVITIES ASSOCIATED WITH HAIRPULLING EPISODES

- Attempting sleep or waking up
- Chores
- Cooking
- Daydreaming/spacing out
- Dealing with children
- Doing homework
- Dressing/undressing
- Driving
- Eating
- Fixing my hair
- Having a difficult conversation
- In bed during the night
- Listening to music
- Looking in mirror
- Making decisions
- Nursing
- Procrastinating
- Putting on make-up

- Reading
- Riding in an elevator
- Riding in the car
- Riding on a train or bus
- Sitting in class
- Sitting in traffic
- Sitting on toilet
- Studying/concentrating
- Taking a shower
- Taking off make-up/washing face
- Talking on phone
- Unpleasant tasks
- Watching TV
- Working at a desk
- Working at home
- Working on the computer
- Writing
- Other

APPENDIX H

SELF-MONITORING ON STOPPULLING.COM:

THOUGHTS ASSOCIATED WITH HAIRPULLING EPISODES

- Anger at self for pulling

- Angry statements at self or other

- Current life problems

- Future events or worries

- Hair treatment

- I can't concentrate without pulling

- I deserve it

- I might as well pull them all out and start over

- I need to pull these eyelashes out to make it match

- I want to feel the "prick" when the hair comes out

- I will feel less tense after pulling

- I will only pull a few

- Past events

- Permission giving

- The hair feels loose

- This hair will bother me until I pull it out

- Thoughts about damage that hair pulling can cause

- Other

APPENDIX I

SELF-MONITORING ON STOPPULLING.COM:

EMOTIONS ASSOCIATED WITH HAIRPULLING EPISODES

- Afraid
- Angry
- Annoyed
- Anxious
- Bored
- Disappointment
- Excited
- Frustrated
- Guilty
- Happy
- Indifferent
- Irritated
- Overwhelmed
- Relaxed
- Rushed
- Sad
- Satisfied
- Tense
- Tired
- Worried
- Other

APPENDIX J

SELF-MONITORING ON STOPPULLING.COM:

PHYSICAL SENSATIONS ASSOCIATED WITH HAIRPULLING EPISODES

- Burning

- Discomfort from a blemish

- Dryness in eyes

- Irritation

- Itching

- Pain

- Physical fatigue

- Premenstrual symptoms

- Sensitivity

- The hair feels loose

- Tickle

- Tingling

- Other

APPENDIX K

SELF-MONITORING ON STOPPULLING.COM:

MOTOR BEHAVIORS ASSOCIATED WITH HAIRPULLING EPISODES

- Face touching

- Feeling for a thick or coarse hair

- Looking at hair before it is pulled

- Running hair/root along face/mouth

- Scratching an itch

- Searching for certain hair

- Stroking hair before pulling

- Touching or rubbing scalp

- Tugging a hair

- Use of hair pulling tools (tweezers, etc.)

- Other

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