

A Comprehensive Model for Behavioral Treatment of Trichotillomania

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In this paper, we explore the essential elements for effective treatment and propose a comprehensive model for behavioral intervention of trichotillomania. Individualized, focused treatment proceeds through four phases: First, a functional analysis is conducted that garners information about critical antecedents, behaviors, and consequences of hair pulling. Next, this information is organized into cognitive, affective, motoric, sensory, and environmental modalities. Then, specific treatment strategies are selected and implemented to target critical maintaining factors through relevant modalities. Finally, evaluation and modifications are made as necessary. The potential advantages of this approach are discussed, as are its limitations.

Trichotillomania (TTM), a disorder characterized by repetitive pulling out of one's hair, has recently been identified as more common, more debilitating, and more complex with regard to structure and phenomenology previously assumed (Christenson, Mackenzie, & Mitchell, 1991; Christenson & Mansueto, 1999; Mansueto, 1990). Efforts to identify effective treatments for TTM have taken several directions, with various levels of success. Some treatments have been found to be helpful for only a percentage of clients, while others have shown high rates of initial success with significant subsequent relapse rates.

Pharmacotherapy has targeted the biological mechanisms that may be related to compulsive/impulsive behaviors, and have therefore employed serotonin reuptake blocking medications (Swedo et al., 1991). In one study, fluoxetine was found to be no better than a placebo in a double blind, crossover study design (Christenson, Mackenzie, Mitchell & Callies, 1991). In another small study, clomipramine was superior to desipramine in reducing pulling (Swedo et al., 1989). Finally, Pollard and colleagues (1991) found that what appeared to be initial success with clomipramine reversed after 3 months and was subsequently ineffective. Thus, the effectiveness of pharmacotherapy is mixed at best.

Initial approaches in behavior therapy targeted the motoric response of pulling, utilizing habit reversal training (HRT) as the central element in treatment (Azrin, Nunn & Franz, 1980). Habit reversal has been shown to reduce hair pulling in adults (Azrin et al., 1980; Mouton & Stanley, 1996). Other researchers have demonstrated the effectiveness of a package of cognitive behavioral strategies, including habit reversal, stimulus control,

relaxation, and cognitive techniques (Lerner, Franklin, Meadows, Hembree, and Foa, 1998; Rothbaum, 1992). Despite these positive results, the effectiveness of behavioral and cognitive strategies varies across clients and involves significant risk for relapse. For example, in the Azrin et al. study, 39% and 33% of clients who could be contacted at 4- and 22-month follow-up, respectively, were still pulling. Similar problems with follow-up response were found by Lerner et al. (1998, for whom 9 of 13 participants were classified as non-responders at follow-up (i.e., 3 to 6 years after a cognitive behavioral treatment package). Thus, the data and treatments available have increased our ability to treat this condition but have highlighted the need for (a) a greater understanding of the possible heterogeneity among those suffering from TTM, (b) identification of alternative treatments for non-responders, and (c) a model to guide clinicians in making decisions about what strategies will be the most effective for a given client.

Treatment planning with this model involves a 10-step process that can be broken down into four general phases. The process is similar to the model for clinical decision-making proposed by C.M. Nezu and Nezu (1995). In the first phase, a functional analysis is conducted in order to identify antecedents, behaviors, and consequences that currently maintain the pulling and will be the targets of treatment. In the second phase, information derived from the functional analysis is used to identify modalities (i.e., cognitive, affective, motoric, sensory, or environmental) through which the antecedents, behaviors, or consequences function. In the third phase, specific treatment strategies that target the factors identified in the functional analysis through the relevant modalities are selected and implemented. Finally, the fourth phase involves evaluation and any necessary modifications based on the outcomes achieved. By incorporating the identification of modalities into treatment planning, this model offers guidance in choosing among the available strategies and, in the third phase, offers multiple directions for treatment. Some of the strategies we give for treatment operate within modalities that have been addressed less effectively by existing treatments. The four phases and the steps involved in each are shown in Figure 1.

Phase 1: Assessment and Functional Analysis

Step 1: Decision to Target Pulling and Orientation of the Client

The model presented below provides a guide for planning indi-

vidualized, focused treatment of TTM and suggests numerous strategies to achieve a reduction in pulling. This approach is designed to be used after the client and therapist mutually agree to target the hair pulling itself rather than some other related or unrelated problem. Many clients who present with pulling suffer from other Axis I and II disorders (Christenson, Mackenzie, and Mitchell, 1991; Schlosser, Black, Blum, & Goldstein, 1994) as well as significant symptoms such as low self-esteem, shame, and relationship problems (Stemberger, Thomas, Mansueto, & Carter, in press). In some cases, the client and therapist may decide that these problems need initial attention, especially since treatment of TTM involves a great deal of dedication and hard work by the client. Certainly, the model presented here should not be applied without a systematic analysis and case formulation guiding the decision of which problem should be targeted. The reader is referred to A.M. Nezu and Nezu (1993) and C.M. Nezu and Nezu (1995) for guidance in this complex decision-making process.

One key to the successful treatment of TTM is the necessary collaboration between client and therapist. The therapist provides a conceptual foundation for treatment, conducts the assessment of the problem through the functional analysis, and provides guidance by suggesting potentially useful strategies for systematically addressing the problem. The client helps select from among the array of proposed techniques, implements those that are chosen, and monitors and reports on the impact of treatment techniques employed. Obviously, it is important that the client be-

come engaged and active in therapy from the outset. To help orient the client and provide a rationale for treatment, there are a number of points that can be made as early as the first session, and then reiterated and embellished throughout the treatment process. What follows is an example of how the therapist may communicate some critical points to the client:

Although it is not yet known what factors cause a person to develop trichotillomania, it is clear that learning and experience play important roles in shaping the way the problem is expressed for any one individual. This treatment approach relies on the power of learning and experience to enable a person to change habitual behaviors associated with hair pulling, as well as thoughts and feelings that may contribute to the problem. Most persons familiar with this approach believe it makes good sense, and experience has shown that it can be effective for helping people overcome their problem with hair pulling.

Since the treatment process can involve the breaking of some powerful and deeply entrenched habits, the therapy process will require effort and practice with techniques designed to interrupt established patterns and to build alternative behavior patterns that do not include hair pulling. While it is true that effort and commitment to therapy will certainly pay off, therapy does not require superhuman effort or extraordinary willpower.

FLOW CHART FOR TRICHOTILLOMANIA TREATMENT

PHASE 1: ASSESSMENT AND FUNCTIONAL ANALYSIS

- Decision to target pulling and orientation of client
- Identification of functional components
- Begin self-monitoring



PHASE 2: IDENTIFY AND TARGET MODALITIES

- Identification of potential modalities to be targeted
- Selection of target modalities



PHASE 3: IDENTIFY AND IMPLEMENT STRATEGIES

- Identify potential treatment strategies within the targeted modalities
- Identify the specific strategies most likely to be used by the client
- Train client in the use of strategies/implement for at least 1 week



PHASE 4: EVALUATION AND MODIFICATION

- Evaluate effectiveness of the strategy
- Select and implement next step in treatment

Figure 1. Flow chart for trichotillomania treatment

Instead we expect that urges and habits associated with hair pulling will weaken over time and provide opportunities for healthy alternative patterns to emerge, get stronger, and ultimately supplant hair pulling. You will have many opportunities to help design specific elements of your treatment so that we can be sure that it fits for you.

As you move through the therapy process, you can expect to acquire new perspectives on your hair pulling and new skills for gaining control over this problem.

Step II: Identification of Functional Components

As is typical of behavioral approaches to treatment, the first phase of this model involves a functional analysis of the individual case of pulling. A detailed discussion of such an analysis is available elsewhere (Mansueto, Stemberger, Thomas & Golomb, 1997); however, a brief review of the factors that must be considered by clinicians will be presented below. In total, four factors are assessed in planning for treatment: two types of antecedents to pulling (i.e., cues that trigger the urge to pull and discriminative stimuli that facilitate pulling), the actual behaviors involved in the pulling, and the consequences of pulling that either maintain or terminate pulling episodes. First, when an urge to pull is reported by the patient, cues that trigger this urge are identified. Possible cues external to the individual include (a) settings where pulling takes place (e.g., bedroom), and (b) implements associated with pulling (e.g., mirrors and tweezers). Internal cues might include (a) affective states, such as anxiety or boredom, (b) visual or tactile sensations, such as the color and texture of hairs, and (c) cognitive cues such as “my hair should be symmetrical” or “these gray hairs have to go.” Discriminative stimuli (SDs) set the stage for pulling to occur and indicate that reinforcement is forthcoming. External SDs include environments free of potential observers (e.g., bathroom, bedroom) and the presence of pulling implements (e.g., tweezers, mirrors). Internal SDs include the urge itself, postural cues, such as “free” hands near the hair, and thoughts that facilitate pulling, such as I deserve to pull or I will only pull a few.

Within the realm of the behaviors involved in pulling, three separate stages can be identified. First is the preparatory stage. This involves activities such as going to a specific place, securing implements, choosing a site on the body, and conducting a visual or tactile search for target hairs. In the second stage, the hair is removed. In this stage, specific hairs may be selected for extraction, and traction may be applied to the hair in specific ways (e.g., one or both hands, slow pull versus quick tug). The final stage of pulling involves the disposition of the hair. Possible variations in this stage include discarding immediately, retaining the hair, examining the hair, or using the hair in oral or tac-

tile self-stimulatory activities (e.g., biting or swallowing the hair or hair root, wrapping the hairs around the fingers, or tickling the face with the pulled hairs).

With respect to the consequences of pulling, both positive and aversive consequences are possible. Experiencing pleasurable sensations, securing a desired hair or hair root, and attaining desirable outcomes (e.g., removal of specific unwanted hairs or eyelashes) are potential positive consequences that maintain pulling. Especially in the case of children, social reinforcers such as attention from others may play a significant role, although this is not usually the case. Other positive consequences include alleviation of stress or boredom, escape from undesirable thoughts (e.g., “I have too much work to do”), and avoidance of obligations at work or at home. Finally, aversive sensations, emotional states, or social outcomes (i.e., being negatively evaluated by others) serve as punishers and end a pulling episode.

From the functional analysis, the clinician can identify possible targets or avenues for treatment. For example, a patient might (a) experience an urge to pull when looking in a mirror, (b) be more likely to pull while driving, because her left hand characteristically rests against her face, (c) begins the process of pulling by twisting, then tugging the hair, and finally (d) end the pulling episode by running the hair across her lips to experience satisfying sensations before discarding the hair. For this individual, each of these functional components offers targets for intervention or an avenue through which the cycle of pulling can be averted; however, the identification of these targets does not clearly indicate the strategy or strategies most likely to be effective in stopping this pattern of behavior. Thus, the second phase of the treatment model is used to provide additional information that will be helpful in choosing or developing strategies likely to be effective for a particular individual.

Step III: Beginning Self-Monitoring

Self-monitoring is a critical aspect of behavior therapy and plays an equally important role in the current model. At this stage in treatment, self-monitoring is one of the primary assessment methods. It is presumed to provide more valid and detailed information than that gleaned from the retrospective report given in an interview. There are numerous possible variables to monitor, but the therapist and client must choose the most appropriate and informative for a particular case. In doing so, the time necessary and motivation needed to complete a lengthy and complicated form versus a simple and short form should be considered. To assist in choosing the variables to assess, a template from which a client’s monitoring form can be designed is shown in figure 2. Following the initial choice of variables to assess, the therapist must spend considerable time training the client to use the form. For example, monitoring of “notable thoughts” requires awareness of mental events, a skill that many clients do not have prior to entering therapy.

As data are gathered and treatment progresses, the monitoring form should be revised. Revisions might reflect new knowledge regarding important variables. For example, the initial focus of therapy might be eyebrow pulling in which a “lack of awareness” plays an important role. Subsequently, the therapist may come to believe that the presence of others enhances awareness; therefore, to test this hypothesis the presence / absence of others should be added to the monitoring form. Changes in the monitoring form also might be made when there is a new focus of treatment. For example, in the case above, a second target for treatment might be scalp hair for which feelings of stress and environmental location are important

It should be noted that self-monitoring also can play a role as a treatment strategy (e.g., see motor modality treatments in Table 1) or to enhance compliance with treatment (e.g., see Step IX: Evaluating the Effectiveness of the Strategy).

Phase 2: Identify and Target Modalities

The second phase of treatment involves the organization of information derived from the functional analysis into a system that points the way to specific treatment strategies. It can be observed in the example above that elements critical to the maintenance of the individual’s hair pulling involve cues and feedback from both the external environment and experiences internal to the individual. These involve a number of interrelated but relatively independent response systems or modalities.

Step IV: Identification of Potential Modalities To Be Targeted

In the approach described here, information derived from a behavioral analysis is organized into four “internal” modalities (i.e., cognitive, affective, motoric, and sensory) and a fifth category for components “external” to the individual (i.e., environmental). The identification of relevant modalities guides the clinician in the selection of treatment techniques. The benefits of using modalities to guide treatment have been discussed by Lazarus (1976), Bandura (1977), and A.M. Nezu and Nezu (1993). The following examples will illustrate this point. If emotional states such as boredom or anxiety trigger pulling, the affective modality is relevant. In such a case, strategies that operate through this modality should be more effective than strategies that operate through the cognitive or motoric modalities. If the thought, “My eyebrows don’t look even,” cues the hair pulling, or if the thought, “Oh, good, I’ve removed all the gray hairs,” reinforces the pulling, the cognitive modality is relevant and offers a promising target for intervention. If the component occurs in the environment (e.g., external cues or external sources of reinforcement or punishment), then the environmental modality is relevant. For example, if attention from patients or peers serves to reward a child’s hair pulling, this occurs in the environmental modality. Finally, if tactile sensations such as itching cue the urge, or if pulling terminates undesirable sensations (e.g., relieves the itching or results in pleasurable sensations),

then the sensory modality is relevant. Thus, for each patient, the therapeutic course is guided by information derived from the functional analysis. Relevant antecedent, behavioral, and consequential components are identified and then organized according to the primary modality through which each exerts an influence on hair pulling. Next, these are linked with modality-based treatment categories from which the clinician selects the specific treatment techniques that will constitute the individualized treatment program.

The relationship between each component of the functional analysis and the modalities in which they might occur can be depicted in a grid, such as the one shown in Figure 3. The vertical axis of the grid presents the components of the functional analysis that have been classified according to a probable modality. The shaded area is used to specify the relationship between possible antecedents, behaviors, and consequences and the five identified modalities. The Xs on the grid mark commonly occurring, though not universal, relationships between functional components and modalities. For the antecedents, listed in the first horizontal section of the grid, identification of relevant modalities is relatively straightforward. For example, certain triggers and facilitators, such as settings and implements associated with pulling, clearly exist in the environment, whereas feelings and thoughts function through the affective and cognitive modalities, respectively. The same is true in the third horizontal section of the grid (i.e., consequences), where the relationship between the possible consequences and modalities is presented. The relevant modality for each consequence is relatively easy to determine for any individual case. For example, when pulling the hair or utilizing the pulled hair in self-stimulatory activities serves to reduce tension for an individual, the relevant consequence occurs within the affective modality. If such activities produced sensations that are pleasurable, the sensory modality is most relevant.

The identification of modalities associated with pulling behaviors (i.e., depicted in the center horizontal section) presents a more complicated picture. Greater diversity exists among individual hair pullers with regard to the modalities that feature prominently in behaviors associated with pulling. The middle of the grid illustrates modalities that are commonly implicated in the preparation, pulling, and dispositional activities. When hair is pulled, the place where hair is pulled and whether implements (e.g., mirrors) are present are typically determined by external factors (environmental modality). When pulling hair while watching television, talking on the phone, or lying in bed, typically no implements are used due to lack of availability of such implements in these environments. Hair is usually pulled with the “preferred” hand through sheer force of habit (e.g., motoric modality). When particular hairs are targeted and pulled to achieve symmetry in the hairline, or to “weed out” unwanted hairs, it is likely that internal direc-

Components and Modalities Grid			Modalities					
Functional Components			Cognitive	Affective	Motoric	Sensory	Environmental	
Antecedents	External	Settings						
		Implements						
	Internal	Affective States						
		Sensation						
		Cognition						
	External	Absence of Other						
		Presence of Implements						
	Internal	Urge/Impulse						
		Postural/Proprioceptive						
		Cognition						
	Behavior	Preparatory	Go to Place					
			Secure Implements					
Choose Body Site								
Visual Search								
Tactile Search								
Pull		Handedness						
		Select Hair						
		Manipulate Hair						
		Traction (gentle, quick)						
Disposition		Quick Discard						
		Retain						
		Examine						
		Self-Stimulate						
Consequences		Reinforce	Positive Emotional States					
			Increase/Decrease Sensation					
			Attain Goal					
	Attention							
	Punish	Negative Emotional State						
		Aversive Sensations						
		Criticism/Disapproval						

Figure 3. Components and modalities grid.

tives (e.g., these hairs are awful and have to go) are driving the behavior (cognitive modality). Twisting, stroking, and manipulation of the hair during pulling are sensations associated with such activities (sensory modality). Finally, hairs are usually discarded quickly, with little or no awareness (i.e., motoric modality), or decisions are made to retain hairs for other uses (i.e., cognitive modality). Retained hairs utilized for visual, oral, or tactile self-stimulation activities (i.e., sensory modality) suggest that the generation of desirable sensations is critical for that individual.

It is important to emphasize that the relationships between pulling behaviors and modalities noted above are provided for illustrative purposes and that many other relationships are possible. For instance, an individual, after noticing coarse, kinky hairs in a public mirror, may return home after a long day and go directly to the bathroom with a large mirror and bright lights and target those hairs for removal. The selection of a place to pull, the securing of implements, the choice of the body site, and the search for target hairs in this illustration is a deliberate implementation of planned, purposeful activity (i.e., cognitive modality). A preferred hand might be used because pulling feels better with that hand (i.e., sensory modality) and characteristic manners of manipulating the hair and wresting hairs free may be strongly ingrained habits (i.e., motoric modality). Following the pull, hairs may be scrutinized to determine whether they have the characteristics sought during the search process. For example, they may need to be the right color or have plump roots attached for the individual to have met the goal (i.e., cognitive modality).

Step V: Selection of Target Modalities

After specific modalities have been identified on the grid for each component of the functional analysis, prominent modalities, or modalities that play a role across the pattern of pulling for a specific case, can be identified. For example, the motoric modality may be prominent in persons who are predominately automatic pullers (e.g., if postural stances facilitate pulling, manipulation of the hair prior to pulling is done habitually and self-stimulatory behavior does not seem to be a critical component). For others, affect may play a significant role in the antecedents, behaviors, and consequences of pulling (e.g., an urge to pull is triggered by feelings of tension, and oral manipulation of the hair results in reduction in tension). For other individuals, the importance of the sensory or cognitive modalities may be apparent. For example, the sensation of coarse hairs may trigger the urge to pull and twirling the hair free of the scalp may produce pleasurable sensory stimulation. Biting and swallowing the root provides significant sensory stimulation for many hair pullers during the aftermath of the pull. In another case, the most prominent features of the pulling may be thought of as, I'll only pull one (i.e., which facilitate pulling) and Now my eyelashes are symmetrical (i.e., which reinforce pulling). In addition,

the role of environmental elements may be central if pulling characteristically involves going to a particular setting and if, in the rare case, attention from others serves as a reinforcer. For many, if not most, individuals, multiple modalities will be important; however, identification of those that are most common, most powerful, or most amenable to change is helpful in selecting initial treatment strategies.

Phase 3: Identify and Choose Treatment Strategies

Having determined the modalities most relevant for a particular individual, the third phase can be undertaken: choosing specific interventions that (a) target the critical components of the functional analysis, and (b) operate through the relevant modalities. By using both pieces of information – that is, the components from the functional analysis and the relevant modalities – targeted and effective treatments can be identified or developed. Table 1 illustrates how each modality offers specific intervention. Many of these interventions include standard behavioral strategies and cognitive strategies specifically addressed in the literature on TTM (e.g., Azrin et al., 1980; Rothbaum, 1992). In addition to these better-known strategies are several that address modalities that have not been the central focus of behavioral interventions in the past (e.g., the sensory modality).

Step IV: Identify Potential Treatment Strategies within the Targeted Modalities

Cognitive Modality

It is within the cognitive realm that the choice of therapeutic interventions is most self-evident. If cognitive features represent a significant contributory factor to hair pulling in a given individual, cognitive approaches – for example, cognitive correction – may be employed. A person who facilitates pulling with cognitions such as I will just pull a few may be instructed to think, I never pull just one; if I start, I will do a lot of damage. Others may think, This kinky hair is ugly and needs to go, or This coarse hair may have a thick hair root. These cognitions facilitate goal-oriented pulling. Restructuring statements such as I am trying to limit my pulling or the root allows the hair to grow may be used.

Another strategy, thought-stopping, suggested by Rothbaum (1992), may be used to interrupt a thought such as, That crooked eyelash has to go. Traditional thought-stopping strategies such as yelling “stop” or snapping a rubber band around one’s wrist can be used to interrupt such thoughts. Finally, coping statements, such as The urge to pull will peak and pass, can be used effectively.

Affective Modality

Within the affective modality, a variety of emotional self-regulation tactics may be utilized. When negative feelings such as tension or anxiety serve as triggers for hair pulling, self-regulation techniques such as progressive muscle relaxation, controlled breathing, self-hypnosis, or positive visualization may be useful. Medications or the use of physical exercise to moderate affect also may be considered. To address external sources of negative affect that may be found to be chronically implicated in an individual's pulling pattern, stress management skills such as assertiveness, time management, and problem solving can be taught. When powerful negative emotions are associated with the presence of undesired hairs, in-vivo or imaginal exposure may prove helpful. For example, when a person has a strong aversion to the presence of a gray hair, continuous and prolonged scrutinizing of the undesired hair (with therapist supervision, if necessary) may generate the strong aversive feelings but ultimately reduce urges to pull. This can be done in-vivo, having the person use actual hairs, or imaginarily, having the person create and hold an image of the undesired hair. As with any exposure strategy, prolonged and frequent exposures increase the likelihood that the affective response and the associated pulling will reduce.

Motoric modality

Within the motoric modality, the typical case involves a strong motor habit with no or minimal awareness. Awareness, or the lack thereof, has been identified as an important variable (Christenson & Mackenzie, 1994). With individual hair pullers exhibiting a more or less "focused" or "automatic" habit, a wide variety of procedures to increase awareness may be employed. Examples include self-monitoring of pulling, wearing fingertip bandages to increase awareness of finger-to-hair contact, using scents on the wrist and fingers so that the smell triggers awareness when the hands are near the face, wearing an elastic elbow brace to increase postural awareness, and using a bio-feedback device to signal when the hand is raised. Response prevention also can be employed in the treatment of hair pulling when the motoric modality is prominent. These can take a variety of forms, including hats, gloves, scarves, taped fingers, "rubber fingers" (i.e., used by office workers when handling paper), eye masks, eyeglasses, or any other device that physically impedes hair pulling, as well as strategies such as keeping the hair wet in vulnerable situations, wearing hairstyles that impede pulling, or keeping fingernails closely trimmed. Competing response training, such as the fist clenching associated with habit reversal (Azrin et al., 1980), is a widely used approach for combatting pulling, and seems most likely to be effective when the motoric modality is dominant. Other response-competing strategies include squeezing or manipulating objects such as Silly Putty or worry beads. Crafts such as knitting, bead work, needlepoint, or any other activity that occupies the hands may be useful for some individuals in certain situations.

Modality	Cognitive-Behavioral Strategy	Specific Intervention
Cognitive	Cognitive Coping	Cognitive Correction
	Cognitive Conditioning	Thought Stopping Covert Sensitization
Affective	Relaxation	Progressive Muscle Relaxation Controlled Breathing
	Emotive	Assertion Journal Writing Exercise
	Imagery	Positive Visualization Self-hypnosis
	Exposure	Imaginal / In vivo Experience
	Medication	Serotonin Reuptake Inhibitors
Motor	Awareness Training	Self-Monitoring Finger Bandages Biofeedback
	Response Prevention	Gloves Scarves Wet Hair Rubber Fingers
	Competing Response Training	Fist Clenching Holding Koosh Ball Knitting
Sensory	Distraction	Baths Massages Facial Masks
	Substitution	Brush Hair Nibble Food
	Extinction	Prolonged Sensory Exposure
	Medication	Cortisone Cream Lacrilube
	Stimulus Control	Dye hair Pull Back Hair
Environmental	Stimulus Control	Remove/Cover Mirrors Eliminate Tweezers Stay Out of Certain Rooms
	Contingency Management	Rewards Penalties Covert Contingencies Snap Rubber-band on Wrist Show Hair to Therapist

Sensory modality

For many individuals, the sensory modality will be a critical factor in their hair pulling. General strategies to address this involve distraction, substitution, and extinction. If a person has sensory cravings, self-care activities such as bathing, facial masks, or manicures may provide stimulating alternatives to hair pulling. Manual stimulation of the pulling site also may be useful. For example, washing the hair vigorously, brushing the hair more often throughout the day, and washing the eye area with a textured sponge may also help reduce the need for sensory stimulation. Sensory substitutes also may be employed. A person who habitually bites the hair or follicle, for example, may be instructed to nibble foods such as sunflower seeds, poppy seeds, sesame seeds, or hard candies. Crunchy foods, such as carrots or celery, appeal to some and bits of candy and food with “fleshy” textures, such as Gummy Bears, appeal to others. A person who likes the feeling of hair in their fingers or between the lips can rub her fingers on soft brushes or run a nylon line between her fingers or lips. Frayed blankets, dental floss, “Koosh Balls,” pot scrubbers, or vegetable brushes all provide different and interesting textures that can provide tactile substitutes for hair. Medications can help alleviate sensory cues that trigger the urge to pull. For example, when itching serves as a trigger for hair pulling, judicious use of cortisone cream or dandruff shampoo may be helpful. When irritated eyelids instigate pulling of eyelashes, use of eye drops or eye lubricating gels can be employed. Finally, stimulus control strategies that reduce sensory cues, such as dying gray hair, having eyebrows shaped by a beautician, changing hairstyles so that hair is not so readily available for pulling, or having extraneous hairs removed by electrolysis, can be useful.

Environmental Modality

The environmental modality also offers numerous options for treatment. When the cues in the environment are strong instigators of pulling, stimulus control procedures can be employed here as well. Tactics such as removing or covering mirrors that are frequently used for pulling, removing tweezers or other implements, or making certain rooms or other settings off limits may be useful. Contingency management, in which a patient is rewarded for attaining daily or weekly treatment goals can be useful for bolstering motivation during therapy. The judicious use of punishment strategies also may be employed. The patient, therapist, or parents may administrate such programs.

Step VII: Identify the Specific Strategies Most Likely to Be Used by the Client

Given the almost limitless possible strategies that exist for a creative therapist and client, it is crucial that the client be given several recommended options from which to choose. Clients will have idiosyncratic reasons for choosing from among their options, and the success of the strategy is probably dependent in part on its appeal to the client. Therefore, the client will need

a detailed review of the possible choices and the opportunity to select those he or she believes will be most helpful.

In many cases, utilizing several techniques that simultaneously operate through different modalities will be employed. For example, it may be helpful for a patient to wear rubber fingertips to raise awareness, nibble raw spaghetti as a sensory substitute, and employ controlled breathing techniques as a stress reducer. When relevant, techniques that target the environmental and sensory modalities typically are introduced early because they can have significant impact. This has the additional benefit of bolstering the client’s motivation.

As self-control increases, urges to pull are reduced, motor habits are altered, or any other indices suggest that the problem is on the wane, the client may be weaned from components of treatment and less intrusive self-management techniques may be employed.

Step VIII: Train Client in the Use of the Strategies and Implement for at Least 1 Week

The therapist also can increase the likelihood that a strategy will be used effectively by realistically educating the client about the rationale for strategy and providing coaching on the steps involved in using the strategy (e.g., securing necessary equipment, scheduling, etc.). Each strategy should be implemented for at least 1 week, and sometimes longer, before a valid assessment of its usefulness can be made.

Phase 4: Evaluation

Step IX: Evaluate the Effectiveness of the Strategy

Once a strategy has been implemented, self-monitoring of pulling should be used to evaluate its effectiveness. However, it is also necessary to monitor the client’s use of the strategy to more clearly examine its relationship to any reduction in hair pulling. For example, if pulling is reduced and the client is using one of the two selected strategies religiously, this suggests a significantly different picture than if pulling is not reduced despite regular use of all recommended strategies. Thus, it is crucial that, once treatment strategies are implemented, the self-monitoring includes assessment of compliance with the program. Results of the evaluation of both pulling and use of the strategies will suggest either that (a) treatment goals are being met, (b) treatment goals are partially met, or (c) treatment goals are not being met.

Step X: Select and Implement Next Step in Treatment

Results of the evaluation will lead to one or more of the following steps in treatment:

1. Maintain use of the currently effective strategies.
2. Maintain use of currently effective strategies, but return

to Phases I and II to guide the selection of at least one additional strategy.

3. Abandon currently ineffective strategies and return to Phases I and II to guide the selection of alternative strategies.

4. Consider modifications to current strategies (i.e., which are either ineffective or not being used) before replacing them.

For example, a client who continues to pull when wearing gloves in bed might try wearing socks on their hands instead.

Overcoming Obstacles to Treatment

During the course of treatment, a number of issues may impede progress. Many of these are relevant to behavior therapy in general, but will be highlighted in the context of the current model. Probably the most frequent problem that arises is noncompliance with the recommended strategies. Successful treatment of hair pulling requires a significant amount of time, effort, and, usually, endurance of discomfort on the part of clients. Anyone who has

had to “break” a deeply ingrained habit or has witnessed another do so can appreciate this fact. When appropriately selected and implemented, the strategies are very powerful; thus, the primary issue for the therapist in overcoming this obstacle is how to get the client to use the strategy consistently.

One possible reason for noncompliance occurs when a crisis arises (i.e., which may or may not be related to the pulling). When this occurs, “pulling-focused treatment” can be put on hold and resumed when the crisis is resolved. For example, a client who shaved her head and had to wear a wig took 2 weeks of sick leave from work in order to avoid facing coworkers and their questions about her hair. During this time, she was so preoccupied with this issue that she was unable to focus on employing the strategies to reduce her pulling. Prior to her return to work and after she did so, significant time had to be spent planning and coping with this crisis.

In other cases, clients seem to place a higher priority on issues other than pulling (i.e., interpersonal relationships, coping with stress in general, processing traumatic issues from the past). Although some clients are able to clearly specify that they want or need to address some other issue, most probably do this indirectly or without realizing what they are doing.

For example, in some cases clients do not use strategies consistently, despite attempts to increase their ability to do so (i.e., feedback, training, encouragement, modification of the strategy), because the strategies require more time / effort / discomfort than the client can commit, given other priorities in their life. Other clients seem to want to spend the majority of

session time on issues other than the pulling. In some cases it seems as if clients have sought treatment for the pulling as an avenue to address other problem areas. In both of the above situations, the therapist must facilitate a frank discussion of the goals toward which the client can and wants to realistically work. In doing so, the therapist must help the client evaluate the costs and benefits of either abandoning pulling as a treatment target or addressing another target for treatment. It may be helpful to clarify for clients that, with time and effort on their part, significant gains in pulling can be made in a short time so that other targets can be addressed relatively soon, during a “maintenance” or “fine-tuning stage” of treatment. After the goals and priorities have been clarified, the decision of which target to choose must ultimately be the client’s.

An additional obstacle to treatment and possible reason for “noncompliance” occurs when the client has trouble accepting the fact that he or she has a problem with hair pulling. Although on the surface this may seem absurd, given that the client is in therapy for pulling, some clients seem to have developed a pattern of shame and avoidance of the issue that impedes direct application of treatment strategies. In such cases, an unspoken goal of the client’s may be to magically make the pulling go away. Therefore, before the treatment strategies can be used effectively, an initial focus of therapy must be for the client to accept the reality of their current and past problems with pulling. Doing so will probably require some reduction of the shame and anxiety related to the pulling. A variety of strategies can be used to achieve this goal, including education by the therapist, reading materials from the OCD Foundation and the Trichotillomania Learning Center, both in-person and online support groups (i.e., such as those run by the Trichotillomania Learning Center), and cognitive restructuring strategies.

Maintenance and Relapse Prevention

Once significant reduction in pulling has been achieved, there are two goals toward which the client must work. The first is maintenance of treatment gains. Once initial success occurs, clients may become less diligent in their use of strategies. Clients may forget to shop for needed supplies (e.g., bandages, petroleum jelly) or fail to assure that items such as sensory substitutes (e.g., dental floss, “Koosh balls”) are available in key settings. Clients also may be tempted, either by a stressful event, a remark from someone regarding new hair growth, or some sort of goal of “testing” themselves, to pull a “little” to see if a binge occurs. Often, simply educating a client about these dangers is sufficient to prevent problems.

Another strategy that can be helpful once pulling has been reduced is to identify or develop less intrusive or demanding strategies. For example, clients who had used progressive relaxation to manage stress might be taught cue-controlled relaxation or diaphragmatic breathing as a less demanding strategy

to use over the long term. Therapist monitoring of progress as well as therapist reinforcement of the use of strategies are helpful as well.

Planning for relapse prevention is a second goal. Given the problems with relapse noted in the outcome literature thus far (Azrin et al., 1980; Lerner et al., 1998; Pollard et al., 1991), as well as our own experience, it seems realistic to assume a significant risk for relapse. An emphasis on the fact that the client must expect and plan for relapse is important. Clients need not think that a relapse indicated that their old pulling habits are back in full force; rather, relapse should indicate that attention now must be paid to the problem but that it will likely diminish more quickly than in the past. A review of the initial functioning analysis as well as discussion with the client should aid in creating a list of potential relapse triggers.

In some cases, long-term prevention of triggers may be the next obvious stage of treatment. The best example of this would be a situation where a patient pulls when in a state of negative affect. If affect management has not already been a focus of treatment, it could be at this time. Other types of trigger prevention might involve avoidance of certain settings (e.g., it is not advisable for a particular patient to install a wall of mirrors in a redecorated bathroom) or activities (e.g., it is not advisable to work swing shift because of exhaustion). A next step in relapse prevention is to help a client define what a relapse is so that he or she can begin using previously useful strategies immediately. Often, parameters include the amount of time a client spends pulling, the number of hairs pulled, the amount of damage done, or the observation of pulling by significant others. Before termination, a client and therapist can review the strategies that were successful and make a list for the client to take home for future use, post-treatment. Any particulars that may be forgotten, such as where to purchase “Koosh balls” or where the relaxation tape will be kept, are noted. Clients are usually urged to keep this list in a safe place and to refer to it as soon as it is needed. A call to the therapist for one or more booster sessions is recommended if the client has any problems using the strategies.

Should a relapse occur, the therapist can begin by reviewing the functional analysis and ascertaining if the current problem has the same functional relationships. If not, modifications should be made and perhaps new strategies attempted. Often, the functional relationships remain the same and the client simply needs review and support of using previously successful strategies.

The decision to terminate treatment is a part of the maintenance and relapse prevention process. The therapist and client together make decisions regarding what the level of treatment progress is, as well as what the level of independence the cli-

ent has in managing the problem. Once the client and therapist agree that the treatment goals have been achieved and maintained for an agreed-upon period of time, termination is possible. As with other types of behavioral approaches, a gradual fading of therapist support is recommended. Often, after initial gains, therapy sessions are scaled back from weekly to biweekly. With continued success, sessions may go to once a month, with telephone check-ins by the therapist.

Utilization of the Model: Two Case Illustrations

Case 1: Brian

Brian is a 34-year-old white male who is married, works as a bond broker, and at the time of treatment was awaiting the arrival of his first child. He presented for evaluation and treatment of chronic hair pulling, which had begun when he was 15 years old. He had no recollection of details regarding his early pulling, but remembers that at one point his eyebrows were almost entirely absent. In an effort to avoid pulling his eyebrows, he began to pull from his scalp, but soon found himself pulling from both sites. In recent years, 90% of his pulling was from the scalp, with the remainder representing sporadic pulling from the brows. He found it necessary to wear a full wig because his head hair was patchy and unsightly, with large bald areas at the temples, crown, and front hairline. He also used an eyebrow pencil to camouflage the damage done to that area. He had resorted to shaving his entire scalp on a number of occasions in desperate attempts to control pulling, but found that he then would do more damage to his eyebrows. He estimated that he spent 2 to 3 hours each day pulling out hairs, with between 30 to 100 hairs removed daily. He reported that hair pulling made him feel disgusted with himself and unhappy with his life. He worked hard to keep his hair pulling a secret from everyone other than his wife, who was supportive but who would become irritated and would “snap” at him when she observed him pulling. A person who loved social events, physical activity, and sports, he had given up virtually all strenuous activity, especially swimming, and had become increasingly reluctant to go to beaches, other well-lit places, or out of doors during wind and rain. His wife acknowledged that she felt constrained by these limitations, and they both worried about the potential effects on the child they expected. Brian had been treated the prior year with Prozac and then Anafranil. He had almost entirely ceased pulling on Prozac, but the results were short-lived and he had returned to former levels within 3 months. A 4-month trial on Anafranil had made the problem more manageable again, but the improvement was offset by problems with weight gain, profuse sweating, and chronic fatigue. For these reasons he turned to behavior therapy.

Phase 1: Assessment and Functional Analysis

Step I: Decision to target pulling and orientation of the client.

Brian acknowledged that his hair pulling had caused him signif-

icant distress over the years. Yet he described himself as “pretty well-adjusted overall” in spite of his problem. It was determined that no comorbid conditions or other circumstances were present that would preclude a direct effort to target the hair pulling itself. His score on the Beck Depression Inventory was 19 at the time he entered treatment. He responded optimistically to an overview of treatment.

Step II: Identification of functional components.

An interview enabled Brian’s therapist to identify a number of antecedent and consequential elements that played significant roles in his hair pulling. It was learned that he typically pulled hair from his scalp in his bedroom while resting in bed or trying to get to sleep, in the bathroom while on the toilet, in his living room while watching TV, in his den while working on his computer, and occasionally in his car on the way to or from work. He would pull from his eyebrows while at his desk working, or in other circumstances when he felt tired and would rub his eyes.

Whether pulling from the scalp or eye areas, he was often unaware that a pulling episode had begun until it was well under way. He habitually stroked, twisted, and felt for individual hairs with the fingertips of either hand, especially in circumstances where he felt fatigued, bored, distracted, or generally restless. At this point, things would quickly change. He reported that portions of his scalp and his eyebrows stimulated by touch would seem to “come alive” with greatly heightened sensitivity. He would “snap” into awareness and pulling would then become very focused. The pulling itself produced very pleasurable sensations. Hairs that felt coarse and had plump roots attached would seem to provide the most pleasure and, thus, would be targeted for pulling. This felt like a “chain reaction” to him because the sensitivity of the pulling sites would further increase, leading to stronger urges to find and pull the most pleasure-producing hairs. He would bite off, nibble, and swallow the roots during these hair pulling “binges,” although he was very ashamed of this behavior. This more focused pattern had become more prevalent over the previous 5 years and represented only about one third of the time spent pulling, but was particularly distressing to him because he felt so out of control. Pulling with little or no awareness accounted for more of the pulling time, but accounted for proportionately fewer hairs pulled.

Step III: Begin self-monitoring.

Brian was given a self-monitoring form and asked to monitor and record daily incidents in which hair pulling occurred or when he experienced significant urges but refrained from pulling. One week later he returned his completed form. A review of the record showed that, while his pulling had been largely true to form, he had resisted pulling in the face of strong urges on a

number of occasions. Still, his records showed that he had, on average, 18 incidents of pulling each day and had removed approximately 500 hairs overall. Despite some pulling, he thought it had been a relatively good week.

Phase 2: Identify and Target Modalities

Step IV: Identification of potential modalities to be targeted.

An analysis of Brian’s hair pulling revealed that pulling occurred in a limited number of situations and settings, typically when he was involved in sedentary activities. Significant antecedents tended to be internally generated but with cognitive triggers notably absent. Idiosyncratic behaviors within the pulling sequence involved stroking and /or manipulation of the hair prior to pulling, with oral self-stimulatory activities often occurring in the dispositional phase.

Sensations occurring on the skin provided both significant cues for pulling and reinforcement of the pulling behaviors. Each of these components and modalities is identified in the shaded area of the components and modalities in Figure 4.

Step V: Selection of target modalities.

For Brian, elements within the motor and sensory modalities were most frequent and seemed the best targets for an individualized treatment approach. As with many clients for whom the motoric modality is prominent, Brian was often not aware of his pulling; therefore, an emphasis was placed on increasing awareness of facilitative behaviors, such as touching the scalp or eyebrows and stroking the hair. Brian was forthright in acknowledging that it would be very difficult for him to forego the sensory stimulation associated with hair pulling. He acknowledged that he could hardly imagine doing without the satisfying sensations derived from pulling and, to a lesser extent, biting and swallowing the roots. Therefore, the sensory modality would be addressed as well. The cognitive and affective modalities seemed of lesser importance in this case, so the decision was made not to target these modalities, at least initially. Within the environmental modality, the link between specific settings and the hair pulling pattern was noted, as was the fact that his wife’s disapproval served to inhibit his hair pulling.

Phase 3: Identify and Implement Strategies

Step VI: Identify potential treatment strategies within the targeted modalities.

Brian and his therapist considered and discussed a number of possibilities for addressing the motor habits and the sensory components. A number of possible choices are listed in Table 1. Self-awareness would likely be enhanced by the self-monitoring that would continue through treatment. In addition, other possibilities for increasing awareness of hand-to-head movements were discussed, such as the wearing of tape on the fingertips or elastic braces on the elbows, both of which provide additional

Components and Modalities Grid: BRIAN			Modalities				
Functional Components			Cognitive	Affective	Motoric	Sensory	Environmental
Antecedents	External	Settings			X		
		Implements					
	Internal	Affective States		X			
		Sensation			X		
		Cognition					
	External	Absence of Other					
		Presence of Implements					
	Internal	Urge/Impulse					
		Postural/Proprioceptive					
		Cognition					
Behavior	Preparatory	Go to Place					
		Secure Implements					
		Choose Body Site					
		Visual Search					
		Tactile Search			X		
	Pull	Handedness					
		Select Hair					
		Manipulate Hair			X		
		Traction (gentle, quick)					
	Disposition	Quick Discard					
		Retain					
		Examine					
		Self-Stimulate				X	
Consequences	Reinforce	Positive Emotional States					
		Increase/Decrease Sensation				X	
		Attain Goal				X	
		Attention					
	Punish	Negative Emotional State					
		Aversive Sensations					
		Criticism/Disapproval					

cues to increase awareness. The employment of competitive responses such as fist clenching (Azrin et al., 1980) was described as were response-prevention tactics, like squeezing an exercise ball or kneading a “Koosh” ball. In the sensory realm, frequent washes with medicated shampoo, scalp massages by his wife, hair and scalp brushing, topical application of cortisone cream, and oral alternatives such as chewing gum or ingesting “nibble” foods were also considered.

Step VII: Identify the specific strategies most likely to be used by the client.

Brian felt that self-monitoring during the previous week had been very valuable. He would continue to monitor urges, pulling, and, in addition, the employment of specific intervention strategies. He also liked the idea of wearing tape on his fingers to increase awareness. He suggested that his wife be enlisted as a therapeutic ally because he felt that the effort might be enhanced if she were given a positive role in the process. Other tactics for intervention in the motoric modality would be held in reserve.

Within the sensory modality, Brian thought that many of the considered tactics had merit. Remembering that he was once able to overcome a tobacco-chewing habit by substituting chewing gum, he preferred to consider that as a first option.

Step VIII: Train client in the use of the strategies and implement for at least 1 week.

The discussion was made to focus first on the motor habit by attempting to increase early awareness. This would provide the opportunities for the sequence of pulling-related behaviors to be interrupted and averted early, before the powerful urges associated with sensory cues (i.e., “aliveness”) became activated. A number of strategies for increasing self-awareness were considered and several were selected for initial interventions. Self-monitoring would continue and it would have the presumed effect of helping to increase awareness. In addition, Brian agreed to carry or keep available a small roll of surgical tape and wrap his fingers at those times when contact was made with the eye or scalp areas. He would wear the tape in the settings most associated with pulling (i.e., watching TV, working at the computer, sitting on the toilet, working in his office, etc.). In addition, he would request that his wife signal him in a non-disapproving way if she observed him touching his hair at any time. Finally, he would buy chewing gum and make sure it was available in situations previously associated with the nibbling and swallowing of roots.

Step IX: Evaluate the effectiveness of the strategy.

At the next session, Brian reported he had bought tape and gum on the way home from his therapy session and was pleased that he had gotten to his house without touching his hair. He had explained to his wife how he wished her to assist and she will-

ingly agreed to help. He had gone a full 5 days without pulling and with minimal touching of hair, and was very encouraged to find that the sensitivity (“aliveness”) of his eyebrows and scalp was virtually absent after 3 days of abstinence.

After these 3 days, “things began to slip.” He described three problem situations that emerged. In bed, while feeling sleepy, he would find that his fingers were often in contact with his scalp and by the fifth evening he was pulling while half-asleep. The following day, while on the toilet just after waking up, he was touching his scalp and some pulling ensued. Later that day when arriving home from work, he removed his wig, rubbed his scalp, and found the familiar “aliveness” returning. His self-monitoring forms showed that pulling was back to baseline levels one day prior to his appointment. He was somewhat discouraged by this turn of events and bothered that his wife was “snapping at him” again. Brian noted with some pride, though, that he had not nibbled or swallowed a single hair since he had employed chewing gum.

Step X: Select and implement next step in treatment.

In light of the mixed results of the initial effort, the plan was modified for the next week. Elements to be retained included record-keeping, taped fingers, and chewing gum. Utilizing his wife had been a “double-edged sword,” he said, so she would be asked to refrain from making any comments at this stage of treatment. His self-monitoring indicated that awareness had been enhanced dramatically, but additional tactics would be required to manage when strong urges were present, when hair pulling had already begun, or when his resistance to pulling was very low (e.g., when “half-asleep”). In addition, sensory cues that provoked strong urges to pull at certain critical times, when taking off his wig, for example, needed to be addressed.

The plan for the next week incorporated some new elements. Response prevention, an approach that can be particularly useful early in treatment when habits and urges are strongest and competitive responses are still weak, was implemented. He continued to wear tape on his fingertips, but when in bed, he would have his thumb and forefinger taped together to discourage grasping and pulling hairs. In addition, Brian suggested he wear a bandanna to bed, something he had tried on his own prior to formal treatment and had found useful in inhibiting stimulation of the scalp with the fingertips. He would slip into a bandanna when he removed his wig. Also, in an effort to interrupt early morning pulling and get the day started on the right course, he would shower first, and either sit with wet hair on the toilet or blow dry his hair while sitting. Finally, Brian was trained in the response competitive element of Habit Reversal Training. If hair pulling were to occur at any time, he would clench his fists for at least 30 seconds in an effort to discourage further pulling.

Course of treatment and outcome.

Over the next eight sessions, treatment strategies were monitored for effectiveness and modified as needed. After the third week of treatment, elements essentially unchanged from those described above, hair pulling had been reduced to only a few isolated incidents each week, with the number of pulled hairs reduced to under 20 per week. Self-report records indicated that a few strands had been pulled prior to getting in the shower, on Friday and Saturday nights while watching movies with his wife, while driving from work, and while lying in bed on Saturday or Sunday mornings. Minor adjustments included re-introducing prompting by his wife through a touch on the arm instead of verbalizations, splashing cold water on his face the first thing in the morning, and taping thumbs and forefingers together for the commute home from work. At Brian's urging, fist clenching was dropped entirely by the fifth session.

Within 3 months enough hair had grown back to allow an "evening-up" haircut by his wife. Some hair had grown back white, so he dyed his hair to its former color. A month later he was able to discard his wig. He had not pulled a hair for over a month. He was encouraged to continue self-monitoring and urges to pull, occurrences of touching or stroking of scalp or brow hairs, "close calls," and the strategies he employed to deal with these occurrences. These were reviewed during three brief, monthly follow-up visits. Six months of pulling abstinence ended with an incident on his summer vacation. Brian had broken his arm during a beach volleyball game. When his wife and friends went off to the beach, he remained behind to care for his infant daughter. Feeling unhappy, uncomfortable, and "a little high on Percocet," he very consciously decided to experiment with pulling a few hairs "to see if it had the old magic." It did and he experienced a few brief lapses over the next week. Shaken, although he probably pulled less than 25 hairs overall, he feared the spell was broken. A single "emergency" treatment session helped him get back on track. About a year later he reported he had not pulled any hairs after the incident at the beach.

Case 2: Mary

Mary is a 45-year-old white female who has been married 17 years and has two male children, ages 13 and 11. She works 30 hours a week as a receptionist and bookkeeper in her husband's contracting business. When she arrived for evaluation and treatment of hair pulling, she had been taking Prozac for over a year. She said she "felt normal for the first time ever." By this she meant that she felt more energetic and less depressed than she could remember feeling. Unfortunately, the drug had no effect on her hair pulling.

Mary vividly recalled that she had begun pulling her hair at age 15, soon after a very stressful period when her family had relo-

cated to a new town. The first girl who befriended her had very coarse hair and she remembered thinking that, while she liked her new friend, she didn't like her hair. A short time later, after noticing that some of her own scalp hairs were more coarse than others, she began to pull out unwanted hairs. She would locate them by touch at first, but she occasionally used mirrors to facilitate the removal of all the coarse hairs she could find. Eventually she had thinned her hair to the point that her parents noticed bald patches on the sides and top of her head.

This pattern persisted until the time of treatment, although the severity waxed and waned over the years. Only during her college years was her hair in good enough shape for her to feel comfortable enough to get her hair cut by a professional. In recent years she had taken to removing the increasing number of gray hairs that appeared on her scalp as well, but a more distressing problem had developed from a long-standing preoccupation with pulling out unwanted hairs from her eyebrows. She had begun shaping her eyebrows in high school, but the problem soon became problematic.

As with her scalp, she noted some particularly coarse hairs growing among her eyebrows that caused her enough distress to feel that immediate removal was imperative. Moreover, the removal of brow hairs inevitably produced a problem with new growth, or "stubs," as Mary called them. She found them intolerably ugly and felt compelled to remove them as soon as possible. Often she would dig at them with tweezers or even pins, producing chronic irritation and scabbing in the brow area. Because more and more eyebrows grew in white, probably as a result of both aging and follicle damage, there seemed to be more and more eyebrow hairs that required removal. Of course, this only exacerbated the "stub" problem. For the past 2 years she recognized that the problem had become the worst it had ever been. She spent hours each day with tweezers and magnifying mirrors in a hopeless campaign against coarse hairs, gray hairs, white hairs, and stubs. She missed social engagements and work days because of pulling. Her hands would ache and her brows would bleed. Her appearance was often unsightly and her children would plead with her to leave the bathroom.

Phase 1: Assessment and Functional Analysis

Step I: Decision to target pulling and orientation of the client.

Even though Mary's TTM caused her significant distress, limited her life, and caused conflict within her family, she remarked that Prozac kept her spirits buoyed well above that which she experienced prior to medication. Her score of 14 on the Beck Depression Inventory suggested that her mood was reasonably good. While her children seemed very upset over her hair pulling sometimes, and her husband had seemed to "give up hope" that she would ever stop, her family life seemed sound. While her pulling pattern would certainly interfere with performance

on most full-time jobs, she had flexible hours in her husband's business, and was able to handle her responsibilities there. She had some good friends who knew about her trichotillomania and were very supportive. In light of these facts, it seemed reasonable to address the hair pulling directly.

Step II: Identification of functional components.

The structured interview facilitated the identification of key elements in the maintenance of Mary's hair pulling. She estimated that about half of the pulling incidents occurred in situations where mirrors were not present. She never pulled from any locations other than her scalp at those times, and she believed that this kind of pulling would be easier to stop. Critical situations for pulling "by touch" were during the 45-minute commute to and from work; the 20-minute drive to pick up her son at school; while talking on the phone, both at home and at work; while reading on her living room couch, kitchen table, or bed; and while watching TV, often in the company of her children. During these times, she was very aware that she searched for coarse hairs and short, newly grown ones with her fingertips. When she discovered one, she would isolate the single hair, yank it out, and quickly dispose of it. She said that the pulling provided her with neither pleasure nor pain, but did seem to help soothe her when she felt "wound up." She was certain that stress contributed to the intensity of these pulling episodes.

The remainder of her pulling episodes occurred in front of mirrors, specifically one of two portable magnifying mirrors she kept in her house or in front of her bathroom mirror. She also owned four or five pairs of tweezers that she kept in convenient locations in her house. In these cases, Mary would closely scrutinize her eyebrows for coarse, stubby, white, and out-of-place hairs and would carefully separate the individual hairs. Her attention would also turn to her scalp where she targeted as many gray, coarse, and newly grown hairs as she could find. The presence of any unwanted hair instigated thoughts to "get it" and she experienced significant emotional discomfort if it proved difficult to isolate and extract. Bright light, magnifying mirrors, and the tweezers made for a relatively efficient process, though she often pulled out "good hairs" by accident. An additional problem was that the more she looked, the more target hairs she would spot, so the process could seem endless as hours slipped by. Often her frustration with her efforts led to digging the tweezer tips into the skin with resulting damage to the skin. If she was interrupted during this process, she felt distressed when she thought of the unwanted hairs she had spotted but could not remove. She resolved to return to complete the job as soon as possible. The hair pulling itself was not particularly pleasurable. She described removing unwanted hairs as "satisfying," as if she had done a "good job" when she was able to remove the offensive hairs she had targeted. Conversely, she felt frustrated and "like a failure" when she was unable to remove an offensive hair for any reason.

Step III: Begin self-monitoring.

Provided with a self-monitoring form, Mary agreed to record daily incidents of pulling, urges to pull, and other contextual details of the pulling. In addition, she would record information on her stress levels, as well as thoughts that accompanied her pulling. A review of her records 1 week later showed that almost two-thirds of her pulling incidents occurred with prior visual scrutiny in a mirror. Total pulling time averaged about 80 minutes each day, with significant variability from day to day. Mary was somewhat surprised how clearly the bad days were associated with higher stress ratings. Numerous entries on her records indicated that much of her focused pulling was accompanied with negative thoughts about certain hairs (e.g., "ugly stub," "got it," "can't stand it," "it's got to go," etc.) The more intense episodes of pulling tended to coincide with more self-talk, stronger urges, more hairs pulled, and more damage to the skin as a result of digging for short hairs with tweezers.

Phase 2: Identify and Target Modalities

Step IV: Identification of potential modalities to be targeted.

Analysis of data from the interview and self-monitoring records revealed that, with regard to the environmental modality, Mary pulled her hair while involved in a variety of activities in a limited number of settings. For the less focused style of pulling, these included driving her car, talking on the phone, reading, and watching TV; for the more focused style of pulling, these occurred while grooming, resting, getting ready to go out or do chores, usually in her bedroom or bathroom. This latter style was associated with the presence of mirrors, bright lighting, and tweezers. A notable feature of Mary's pulling was the presence of cognitive triggers that instigated the hair pulling sequence, the preoccupation with "doing a good job" of finding and removing unwanted hairs, and the congratulatory or recriminating self-statements that follow the hairpulling. These tended to be accompanied by concordant feelings that served either to energize further hair pulling or to mediate the cessation of the pulling activity. Further, affective involvement figured in the exacerbation of hair pulling when she was experiencing stress. Each of these components and their associated modalities are identified in Figure 5.

Step V: Selection of target modalities

For Mary, elements within the environmental, affective, and cognitive modalities seemed most relevant to her pulling and therefore were targets for early intervention. While certainly active during tactile and visual searches for target hairs (i.e., the antecedent phase), the sensations directly resulting from the pulling of hairs did not, in themselves, appear to be crucial to the maintenance of her hair pulling. In addition, while motor habits were no doubt involved in the less-focused style that characterized part of her problem, there was a relative absence of motor-driven automatic pulling associated with the greatest

Components and Modalities Grid: Mary			Modalities				
Functional Components			Cognitive	Affective	Motoric	Sensory	Environmental
Antecedents	External	Settings					X
		Implements					X
	Internal	Affective States		X			
		Sensation				X	
		Cognition	X				
	External	Absence of Other					
		Presence of Implements					X
	Internal	Urge/Impulse					
		Postural/Proprioceptive					
		Cognition					
Behavior	Preparatory	Go to Place					
		Secure Implements					X
		Choose Body Site					
		Visual Search	X				
		Tactile Search					
	Pull	Handedness					
		Select Hair				X	
		Manipulate Hair					
		Traction (gentle, quick)					
	Disposition	Quick Discard					
		Retain					
		Examine					
		Self-Stimulate				X	
Consequences	Reinforce	Positive Emotional States		X			
		Increase/Decrease Sensation					
		Attain Goal	X				
		Attention					
	Punish	Negative Emotional State			X		
		Aversive Sensations					
		Criticism/Disapproval	X				

proportion of hair pulling incidents. Consequently, intervention in the sensory and motoric modalities were considered of secondary importance in this case.

Phase 3: Identify and Implement Strategies

Step VI: Identify potential treatment strategies within the targeted modalities.

After reviewing the results of the modality analysis with Mary, her therapist suggested a number of possible treatment strategies for her consideration. A few environmental changes would be likely to have a quick impact. She was asked to consider removing the tweezers and magnifying mirrors from her house as early in treatment as she could possibly tolerate. Other suggestions included grooming at a different mirror to reduce the likelihood of scrutinizing her eyebrows and scalp hairs. Notes taped on the mirror might stand as reminders (e.g., STAND BACK, DON'T SCRUTINIZE).

Of course, this raised the issue of how she would live with increasing numbers of stubs, as well as white, gray, and coarse hairs on her brows and scalp. This problem could be addressed through strategies operating within the cognitive and affective modalities. Learning to think in ways that were less conducive to pulling would be useful and perhaps critical. She was urged not to think of "stubs that must be removed" but of "baby hairs that can grow to be beautiful." Positive visualization exercises also might be employed to increase acceptance of variations in hair texture and color as interesting and attractive. In the affective modality, breathing control, differential muscle relaxation, and exposure techniques, involving controlled exposures to bothersome hairs, were also considered. Response-prevention tactics, such as wearing driving gloves in the car, smearing Vaseline on her eyebrows while alone at home, and wearing awareness-enhancing spot plastic bandages on the fingertips in other situations, would be considered if additional interventions in other modalities were required.

Step VII: Identify the specific strategies most likely to be used by the client.

To the surprise of the therapist, Mary preferred to remove all tweezers and magnifying mirrors from the house as a first step in treatment. She also liked the idea of reducing lighting in her bathroom and committed to taking that step. Additionally, she would utilize driving gloves, Vaseline, or spot bandages if she found herself absentmindedly touching her brows or scalp in the usual situations. Finally, she agreed to continue self-monitoring and keep records of the techniques she employed and the degree of success each contributed to her management of hair pulling.

Step VIII: Train client in use of the strategies and implement for at least 1 week.

The strategies preferred by Mary were essentially self-evident in terms of application. Her therapist suggested that Mary have a specific plan for disposing of the mirrors and tweezers and Mary chose to call a friend and arrange for delivery of those items to her later that evening. Also, she agreed to stop at a nearby shopping center to purchase driving gloves, Vaseline, and spot bandages so they were immediately available to her. Finally, her therapist asked her to anticipate some of the potentially bothersome consequences of the choices she had made and to begin making plans to address them. For example, Mary noted that she would not be able to perform the depilation required to keep her eyebrows shaped as she preferred them. A potential solution was to wait a week or two and schedule an appointment to have her eyebrows shaped professionally at a beauty salon.

Phase 4: Evaluation and Modification

Step IX: Evaluate the effectiveness of the strategy.

Mary returned a week later to report on the outcome of her efforts. She was very pleased to report that she had not pulled out a single eyebrow hair. Her records indicated that she had experienced, but was able to resist, powerful urges to pull from her brows on a Saturday afternoon while doing chores at home. She resorted to her Vaseline and credited it with getting her through "a rough one." She had another close call the evening prior to her therapy session. During an unusually long conversation with a friend, her husband began to act very annoyed. This upset Mary very much and her thoughts turned to pulling out some eyebrow hairs. The urges felt strong but she was able to resist. She also reported that she had not done any close-up scrutinizing of her brows and scalp.

She did, however, pull about 70 hairs from her head during four separate incidents. She had not been able to find a suitable pair of driving gloves until late in the week, she said, so on three separate occasions she pulled hairs from her scalp while driving in traffic. The other incident occurred when she had forgotten to put spot bandages on her fingers before bed, and began pulling before she realized it. She felt too tired and so she "pulled her way to sleep." It was dawning on Mary that ending the routine pulling of scalp hairs was going to present her with a greater challenge than she had anticipated. Finally, she reported that the thought of unwanted hairs growing was beginning to give her "restless feelings" and she felt like she wanted to pull some out.

Step X: Select and implement next step in treatment.

All in all, Mary felt the initial therapeutic effort had gone well. Most of the elements would be retained for the coming week. At that session she was given her first training in progressive muscle relaxation techniques and controlled breathing. She

took to it readily, becoming deeply relaxed in the office, and enjoying the experience immensely. She was provided with a tape of the therapist's relaxation instructions and was encouraged to practice for 20 minutes three to five times in the coming week. At the next session she would be taught to employ differential relaxation and controlled breathing exercises in stressful situations.

Course of Treatment and Outcome

Over the next few sessions a few problem areas were noted and addressed. Mary reported that relaxation and breathing control were very helpful in many circumstances. She had something to turn to instead of pulling; however, she insisted that "it doesn't work in the car." Moreover, she didn't like wearing driving gloves, taped fingers were annoying, and gripping the steering wheel hard wasn't enough. Fortunately, recordkeeping revealed that she rarely pulled out any scalp hairs when she wore her hair "up." Wearing her hair "up" in combination with controlled breathing turned out to be remarkably effective strategies for gaining control of pulling in the car. The new hair style also contributed to a significant reduction of pulling in other situations as well. By the sixth therapy session, Mary had still not pulled out any eyebrows. She reported that the urges to pull had lessened over time, even though she had become more lax about observing the no-scrutinizing rule. She attributed this to the many discussions in therapy that had focused on acceptance of hairs even though they might be coarser or whiter than the others and the fact that she had learned to "talk" to herself differently about her hair.

Such perfect results were not sustained indefinitely, however. Over the following month she had gone without pulling every other week, but had pulled on a single occasion one week and on two occasions during the next week. Still, no more than eight hairs had been removed in any one incident. By reviewing these incidents it became clear that Mary was vulnerable to hair pulling when she was tired and upset. She believed that on those occasions she had "turned in" on herself and pulled some hairs as a result. She vowed to stand up for herself in similar circumstances and commit to not making the situation worse by pulling out hairs.

For the next 2 months, little changed for Mary, except getting a "makeover" that included dyed hair (to cover the gray ones), a new hair style (long enough to pile on top of her head), and acceptance of some white hairs in her now full and well-shaped eyebrows. (Her beautician said her eyebrows could not be dyed.) These weeks were marked by occasional incidents of minor hair pulling and some simple adjustments to her therapy program. Mary was pleased by the notable improvement she had made, but was bothered by the occasional incidents of minor hair pulling. It was decided that she would collect her pulled hairs in a plastic bag and bring them into therapy with her. This was an

unpleasant prospect for Mary but she thought it would provide greater motivation to stop pulling entirely. Within a month she had stopped all pulling. Moreover, she hadn't experienced any urges to pull for weeks, so the decision was made to end weekly therapy sessions.

At a 3-month follow-up she had two very minor incidents of pulling and considered TTM to no longer be a problem. A phone call 19 months later confirmed that her hair pulling problems seemed very much behind her.

Comments and Conclusions

The treatment model presented in this paper attends to the diverse and idiosyncratic nature of factors that encourage and maintain hair pulling and related this information to the modalities of human experience. By doing so, it provides a conceptual bridge to various behavioral interventions and suggests a broad array of therapeutic strategies geared to the individual characteristics of each case of hair pulling. This should enable therapists to derive multiple avenues for treatment that flow from an integrated and cohesive conceptualization of TTM. An additional benefit of this model is that it demonstrates how the diverse techniques for treatment of TTM represented in the behavioral literature (Friman, Finney, & Christopherson, 1984) may be organized within a coherent framework for decision-making. While suggesting numerous therapeutic options and providing a system for therapeutic decision-making, this approach to the treatment of TTM leaves many specific decisions to the therapist's judgment. For example, the therapist must decide, in consultation with the client, which therapeutic techniques to employ, in what order, and at what pace. By carefully monitoring the impact of these techniques, the client and therapist can revise and refine the individualized treatment program to enhance its effectiveness. In addition, collaboration between therapist and client may be needed to moderate techniques so that, over time, less invasive forms may be used.

Despite the benefits to be gained from using this model, its limitations should be addressed. As mentioned previously, this model does not address hypothesized, distal determinants of hair pulling such as biological vulnerability or family dysfunction. Also unaddressed are comorbid conditions (e.g., depression, Tourette Syndrome) or dysfunctional characteristics (e.g., perfectionism, low self-esteem) that might coexist or interact with TTM.

Finally, the model has yet to be empirically tested. A number of specific questions suggested by this model are particularly in need of investigation, such as: (a) does the identification of critical modalities for individual hair pullers lead to more effective treatment strategies? (b) are there identifiable subtypes of pulling with which specific therapeutic strategies are most effective? (c) are there specific interventions within a given

modality that are more or less effective? (For example, within the motoric modality, is habit reversal generally more effective than response prevention?), and (d) does this model improve relapse rates shown by other models of treatment? Examination of these questions will lead not only to enhanced knowledge regarding the model but, more importantly, will allow for its refinement and enhanced ability to guide the treatment of this troubling condition.

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