PARENTING AND EMOTION REGULATION
IN PEDATRIC TRICHOTILLOMANIA

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# TABLE OF CONTENTS

List of Tables...........................................................................................................................................4
Acknowledgement..........................................................................................................................................5
Abstract.......................................................................................................................................................6
Introduction.................................................................................................................................................7
   Hypotheses..................................................................................................................................................21
Method........................................................................................................................................................23
   Participants..............................................................................................................................................23
   Procedure..............................................................................................................................................24
   Measures...............................................................................................................................................25
   Data Analytic Plan..................................................................................................................................28
Results.......................................................................................................................................................29
Discussion...............................................................................................................................................33
Appendix..................................................................................................................................................48
References.................................................................................................................................................53
List of Tables

Table 1. *Demographic Information about Trichotillomania and Control groups* ..........48

Table 2. *Summary of Means, Standard Deviations, between-group differences of Trichotillomania and Control groups* .......... .................................49

Table 3. *Bivariate Intercorrelations among measures in Trichotillomania group* ..........50

Table 4. *Prediction of Trichotillomania Severity and Trichotillomania Impairment* ......51

Table 5. *Prediction of Emotion Regulation in Trichotillomania group* ........................ 52
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Parenting and Emotion Regulation in Pediatric Trichotillomania

Abstract

by

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Previous findings indicate that hair pulling may serve as a soothing behavior to modulate undesired emotions in individuals with Trichotillomania (Hair Pulling Disorder). However, little is known about general emotional functioning of children with compulsive hair pulling and how it may relate to parenting practices and family climate. The current study investigated the relationships between emotion regulation, parenting, and expressed emotion relative to pediatric hair pulling by comparing two groups (Trichotillomania, \( n = 27 \); Healthy Controls, \( n = 20 \)) and examining the predictive validity of emotion regulation, parenting, and expressed emotion on Trichotillomania severity and impairment. Results indicate that children with Trichotillomania struggle significantly more effective emotion regulation and show greater emotional lability than healthy controls. Less warmth/acceptance was associated with higher symptom severity. Results yielded significant differences across groups relative parenting practices, family functioning, and no relationships between emotion regulation, expressed emotion, and Trichotillomania. Further, emotion regulation was also not predicted by parental psychological control and family criticism. Findings and implications are discussed.
PARENTING AND EMOTION REGULATION IN PEDIATRIC TRICHOTILLOMANIA

Trichotillomania (TTM) is a psychological disorder in which individuals engage in repetitive and chronic hair pulling from their body or scalp (American Psychiatric Association; 2013). Hair loss may range from unnoticeable to clearly apparent or severe (Harrison & Franklin, 2013, Park et al. 2012). Lifetime prevalence of TTM is estimated to be 1% to 3.5% (Christenson, Pyle et al., 1991), with reported rates of subclinical hair-pulling reaching as high as 15% in young adult samples (Rothbaum, Shaw, Morris, & Ninan, 1993). TTM causes dysfunction in occupational, academic, social, and familial settings (Franklin, Tolin, & Diefenbach, 2007, Diefenbach, Reitman & Williamson, 2000; Diefenbach, Tolin, Hannan, Crocetto, & Worhunsky, 2005), and results in significant amounts of time attempting to conceal hair loss and/or avoiding social and public events (APA, 2013). Prevalence in pediatric populations may be higher than in adult populations (Wright, Schaefer, & Solomons, 1979); however, this finding has not been replicated. The typical onset of TTM is 13 years of age (Christenson, MacKenzie, & Mitchell, 1991; APA, 2013).

Despite this early onset, the literature provides very little child specific evidence and is devoid of developmental models as current theories are based entirely on adult conceptualizations. In this context, early work on TTM proposed that hair pulling is a learned response acquired to regulate tension and stress (Azrin & Nunn, 1973), while more recent models have emphasized cognitive, behavioral, and/or sensory modalities (Penzel, 2002, 2008; Mansueto, Stemberger, McCombs, & Golomb, 1997; Rothbaum &
Ninan, 1994). One common component between models is their emphasis on concomitant affective processes and how hair-pulling behavior may be intended to reduce unwanted internal experiences (Azrin & Nunn, 1973; Diefenbach, Reitman, & Williamson, 2000; Penzel, 2002; 2008).

Mansueto’s (1997) widely accepted and influential comprehensive model may provide a helpful framework to understand the relationship between affect and hair pulling behaviors. According to the model, external and internal stimuli, e.g. affective states, acquire the capacity to cue hair pulling urges through reinforcement. First, hair pulling is negatively reinforcing as the behavior decreases unwanted affective experiences across the arc of a pulling session. Second, hair pulling is positively reinforcing as it gradually increases positive affect across the pulling session (Mansueto et al., 1997; Penzel., 2002; APA, 2000).

In fact, several studies confirmed robust links between TTM and co-occurring negative affective states (Christenson, Ristvedt, & MacKenzie, 1993). Similarly, patients with compulsive hair pulling endorse high levels of co-occurring depressive and anxiety disorders in adults (Mansueto, 1990, Stanley, Borden, Mouton, Breckenridge, 1995, Lewin et al, 2009) and moderate to high co-occurrence of depressive and anxiety symptoms in children (Stanley, Borden, Mouton, & Breckenridge, 1995; Diefenbach, Mouton-Oden, & Stanley, 2002; Diefenbach, Tolin, Meunier, & Worhunsky, 2008). Further, recent treatment-outcome trials have shown that addressing TTM patients’ affect self-regulation skills in therapy may improve conventional behavior therapy approaches (Begotka, Woods, & Wetterneck, 2004; Woods & Twoohig, 2008; Keuthen et al., 2010). To address the question whether hair pulling modulates affect intensity and affective
states before, during, and after a pulling episode, Diefenbach et al (2008) examined individuals with subclinical and clinical Trichotillomania. The study reported that subclinical as well as clinical groups showed decreases of negative affect and increases of relief and calmness over the arc of a pulling session. Additionally, the clinical group evidenced larger decreases of high negative affect and larger increases of relief and calmness relative to the subclinical group. When comparing pre-pulling to post-pulling scores, the authors also reported significant anxiety reductions in both groups, with the clinical group showing greater decreases in anxiety relative to the subclinical group (Diefenbach, et al., 2008). In concert, these findings lend weight to the conceptualization that hair pulling may indeed serve as an external affect-regulation strategy and that understanding affective processes may be a key component to understanding and treating TTM in adults.

Despite the progress in understanding affect-related processes in adults with TTM, little effort has been made to understand these processes in child and adolescent populations. Given maturational, temperamental, self-regulation changes across development, and in considering differences between social demands and relational family dynamics between child and adult populations, it is important that research investigates possible etiological and syndromal differences (Eisenberg & Spaniard, 2004; Southam-Gerow & Kendall, 2002). Investigators emphasize the need for developmentally sensitive models and research to understanding and examining psychopathology with respect to affect (Southam-Gerow & Kendall, 2002).

Currently, the only pediatric TTM study focusing on affective processes aimed at illuminating reinforcing mechanisms in a sample of 15 parent-child dyads (Meunier,
Tolin, & Franklin, 2009). The researchers observed changes in affective states from onset to termination of pulling episodes and reported that children with TTM seemed to achieve significant reductions in negative emotions across the time of a pulling episode. Despite providing some evidence for an “affect regulation model of TTM” in a child sample, unfortunately the study had several limitations which limits its generalizability. In addition to a small sample size and the lack of a control group, the researchers also had to remove three items of their assessment battery due to their skewed and kurtic distributions. Considering the limitations of Meunier and colleagues’ study (2009) and the general dearth in the pediatric TTM literature, more studies are needed to understand the relationship between emotional functioning in children with TTM and hair pulling.

Although TTM studies focused on describing affective concomitants and on delineating affective changes across pulling sessions, researchers paid little to no attention to the specific construct of emotion regulation (ER) – the ability to self-regulate the experience, expression, form, duration, and intensity of affective states in an adaptive way through inhibition and reappraisal (Eisenberg & Spaniard, 2004; Chiccetti, 1997). However, this is relevant, because ER deficits are recognized risk- and maintenance factors for anxiety disorders (Suveg & Zeman, 2004), mood disorders (Silk, Steinberg & Morris, 2003; Dickstein & Leibenluft, 2006), and impulse control deficits (Gratz & Roemer, 2004) – with the latter clearly capturing the difficulty of disengaging from hair pulling. Conversely, ER skills have been recognized as a protective factor and linked with less emotional and behavior problems (Eisenberg & Spaniard, 2004), successful peer (Hubbard & Cole, 1994), family (Volling, McElwain, & Miller, 2002), and academic adjustment (Gumora & Arsenio, 2002). Considering the association between
affective changes and compulsive hair pulling, it is reasonable to propose that children with TTM exhibit more ER difficulty and more emotional reactivity compared to normally developing children. In this light is also reasonable that children with higher ER deficits are more likely to exhibit stronger hair pulling tendencies.

Currently, the only evidence in direct support of this hypothesis comes from an adult TTM sample. Shusterman and colleagues’ (2009) internet TTM study investigated how frequently participants are able to control and “snap out of” boredom, anger, guilt, indifference, tension, irritability, sadness, anxiety, and shame using a previously not-validated self-report measure. They reported a linear negative correlation between ER ability and TTM severity after accounting for anxiety, worry, and depressive symptoms.

Despite limited evidence linking pediatric TTM to ER skill, some studies have examined ER in child OCD, a related disorder. Both OCD and TTM disorders are in the same diagnostic category of Obsessive-Compulsive Spectrum Disorders and have significant symptom overlap including repetitive, stereotypical behaviors, and impaired ability to control impulses and urges, and high co-morbidity with other emotional disorders (APA, 2013; Comer, Kendall, Franklin, & Hudson, 2004). Similarly to pediatric TTM, pediatric OCD average symptom onset is also in puberty with patients reporting distress, experiential avoidance, difficulty to disengage from obsessions, and time consuming engagement in stereotypical behavior repetitions (APA, 2013; Evans, Lewis, & Iobst, 2004). Most importantly, there is evidence for positive associations between ER deficits and OCD in children and adolescents (Evans et al., 2004), demonstrating that children with OCD show even poorer ER skills than children with
Generalized Anxiety Disorder (GAD), Separation Anxiety Disorder (SAD), and Social Phobia (SoP; Suveg, et al., 2011, 2012).

Taken together, the literature suggests that hair pulling may serve as an external, senso-motor approach to regulate undesired emotions and resulting distress. While most studies related to affect and TTM assessed affective correlates and the affective changes across the arc of hair pulling episodes, little work focused on individual ER skill in pediatric TTM. Even though preliminary evidence suggests fundamental deficits in ER in adult TTM patients, the pediatric TTM literature remains virtually unequipped to answer whether this is also the case with children and adolescents with TTM. With this in mind, this study aims to elucidate the relationship between pediatric TTM and ER skill. Taking the current child psychopathology literature into consideration, it is possible that children and adolescents with TTM and baseline ER deficits show higher TTM symptom severity relative to those with less severe or no symptom presentation.

In part differences in ER skill are likely to be explained by intrinsic factors such as temperament, neurobiology as well as genetic heritability (Fox & Calkins, 2003). Nevertheless, the developmental literature of the last 30 years has also suggested that family climate impacts the socialization of children’s and adolescents’ affect-related experiences, and by implication their understanding, expression, and ability to self-control their affective experiences (i.e. ER) (Darling & Steinberg, 1993; Eisenberg, Cumberland, & Spinrad, 1998; Sheffield-Morris, Silk, Steinberg, Myers, & Robinson, 2009). In this regard, several parenting characteristics appear to impact the development of affect self-regulation and child psychopathology.
Family Climate and Parental Affect-Related Socialization Behaviors

Psychological control

One such parenting factor may be psychological control. Literature suggests that psychological control may be harmful and predictive of child and adolescent behavior problems (Barber, 2002). Psychological control describes parenting strategies that include shaming, guilt induction, withdrawal of affection and attention (i.e. constraining verbal expressions), and invalidation (i.e. correcting/denying children’s concerns and feelings) with the intention to modulate offspring behavior (Barber, 1996; McShane & Hastings, 2009). Several findings suggest that parental psychological control is frequently accompanied by emotionally erratic behavior in adults (Barber, 2002; Nelson, Yang, Cogne, Olsen, & Hart; 2013), and is negatively associated with children and adolescents’ (referred to as children going forward) emotional self-regulation skills (Cui, Morris, Criss, Houltberg, & Silk, 2014). Core features of psychological control, that is shaming, love-withdrawal, and denying children’s concerns, are commonly perceived by children as devaluing and rejecting (Nelson et al., 2013), which, in accordance with parental-rejection theory directly relates to children’s psychological adjustment (Khaleque & Rohner, 2002). In concert, said core components combined with the unpredictability of erratic parent behavior are likely to provoke overwhelming, intense, and volatile affective states in children who in turn may have little opportunity to escape their parent’s erratic behavior (Nelson et al., 2013). In other words, the person that children rely on for comfort and security, may become a major source of affective dysregulation, psychophysiological arousal, and consequently a detriment to children’s ability to self-regulate intense and unwanted emotions (Katz & Gottman, 2002). Not
surprisingly, several independent studies and meta-analyses link high parental psychological control to ER deficits in offspring (Calkins, Smith, Gill, & Johnson, 1998; Snyder, Stoolmiller, & Wilson, 2003; Cui et al., 2014), early child internalizing problems (Sheffield-Morris et al., 2005, Parke & Buriel, 1998), pediatric anxiety and pediatric depression (Barber et al., 1994; Pettit, Laird, Dodge, Bates, & Criss, 2001; Barber, Stolz, Olsen, Collins, & Burchinal, 2005), and subsyndromal OCD in young adults (Aycicegi, Harris, & Dinn, 2002).

Thus far no pediatric TTM study has investigated psychological control as a potential risk factor in pediatric TTM. Considering the substantial evidence linking psychological control to internalizing pathology and ER deficits, it is plausible that high parental psychological control may also be linked to TTM, particularly since it may outweigh protective factors, such as high parental warmth and acceptance (Aunola & Nurmi, 2005).

*Parental acceptance, warmth*

Another parenting dimension with potentially salient implication for child development is parental warmth and acceptance. Parental warmth/acceptance describes how parents are emotionally supportive and non-judgmental, or, respectively, how parents may be rejecting by being cold or indifferent toward children’s concerns (Barber, 1996). High parental warmth, acceptance, and responsiveness have been linked to adaptive and self-regulatory child development (Cohn & Tronick, 1983, Eisenberg, Fabes, Schaller, Carlos & Miller, 1991) and low rates of internalizing disorders (Siqueland, Kendall, & Steinberg, 1996). Conversely, parental rejection, low levels of parental acceptance, and absence of parental warmth (i.e. emotional coldness) have been
observed in families of adolescents with depression (Garber et al., 1997) and children with intense anger (Snyder, Stoolmiller, & Wilson, 2003). Similarly, hostility, rejection, and dismissiveness have been recorded in parents with children with poor affective self-regulation ability (Strayer & Roberts, 2004), anxiety and depression (Rapee, 1997; Chorpita, Brown, & Barlow, 1998; Siquland, Kendall, & Steinberg, 1996; Ge, Lorenz, Elder & Simons, 1994, Galambos, Barker, & Almeida, 2003; Bosco, Renk, Dinger, Epstein, & Phares, 2003) and in children with poor impulse-control [e.g. Attention Deficit/ Hyperactivity Disorder (Alberts-Corush, Firestone, & Goodman, 1986), OCD (Rady, Salama, Wagdy, & Ketat, 2012) as well as in Tourette’s Syndrome (Cohen, Sade, Benarroch, Pollak, & Gross-Tsur, 2008)].

A significant literature specifically highlights the role of parental non-judgmental responsiveness and acceptance of children’s expression of negative affect. This literature suggests that parental non-judgmental and warm regard is essential in the development of children’s emotional and behavioral self-regulation skills (Darling & Steinberg, 1993; Barber, Olsen, Stolz, Collins, & Burchinal, 2005; Grolnick & Farkas, 2002). This is in line with findings reported by Gottman, Katz, and Hooven (1996), describing the positive impact of parental emotion coaching. Emotion coaching is described as parental awareness, warmth, and non-judgmental attitude toward different, intense, and/or negative child affect. As opposed to being dismissive, indifferent, and/or punitive, emotionally supportive parents utilize emotionally charged situations as intimate affect-related teaching opportunities, which allow the child to explore their own affective processes and its consequences. According to Gottman and colleagues (1996), children with emotion-coaching parents display more adaptive vagal tone responses, a
physiological indicator of adaptive ER ability, during emotionally charged situations. At follow up, children with emotionally supportive and warm parents, endorsed less internalizing and externalizing problems, developed more empathy towards others, and were academically more accomplished than children of parents with low emotion coaching habits.

Taken together, it stands to reason that high parental acceptance/warmth are protective, whereas, low warmth/acceptance is detrimental to healthy child affective socialization and in turn, the development and severity of psychopathology. Following this reasoning, we expected a significant association between TTM and low parental warmth/acceptance, specifically, that children with parents endorsing low levels of warmth/acceptance are likely to endorse higher levels of TTM severity.

*Behavioral Control*

A third, frequently investigated parenting dimension relative to child behavior problems and developmental psychopathology is behavior control. Behavioral control focuses on the consistency of monitoring child activities, granting/withdrawing autonomy, and voicing parental expectations (Barber, 1996). Behavioral control is conceptualized as the spectrum ranging from lax/inconsistent control to firm control. Traditionally, models and research on externalizing behavior problems emphasize the central role of firm behavior control in cycles of escalation between parents and defiant children (Loeber & Tengs, 1986; Stormshak, Bellanti, & Bierman, 1996). However, theoretical and empirical work regarding behavioral control and internalizing behaviors are sparse and equivocal at best. While some cross-sectional investigation evidenced small negative associations between firm behavior control and child internalizing
behaviors (Rapee, 1997; Barber, Olsen & Shagle, 1994), longitudinal investigations of
several hundred child-parent dyads did not substantiate such observations over a time
span of three years (Barber et al., 2005). Similarly, studies on parenting and family
functioning in OCD, suggest no significant differences on behavioral control between
normal controls and families with OCD-affected children (Black, Gaffney, Schlosser, &
Gabel, 1998), but rather emphasize deleterious effects of gross parental accommodation
on the one hand, and punitive, harshly critical, and antagonistic communication on the
other hand (Renshaw, Steketee, & Chambless, 2005). Taken together, the literature
suggests behavioral control to be relevant primarily in the study of aggressive or
oppositional, defiant children but not in children with impulse behavior problems in the
context of internalizing behaviors. Therefore, we expected that behavior control will not
be significantly associated to chronic hair pulling in children.

*Parenting in Pediatric Obsessive Compulsive Disorder*

As mentioned before, OCD and TTM share a common phenomenology –
therefore it is helpful to give special consideration to the OCD related parenting evidence.
Despite efforts to identify parenting and family risk factors of OCD, reports based on
child samples are extremely scarce. One notable exception reported low familial warmth
and decreased emotional connection relative to families with healthy children (Valleni-
Basile et al., 1995). Studies related to specific parenting characteristics, relying mostly on
retrospective reporting, find that OC-symptom severity is linked with parental
overprotection, less parental and familial emotional warmth, and more rigidity, rejection,
and authoritarian parenting compared to normal controls (Ehiobuche, 1988; Hoekstra et
al., 1989; Timpano, Keough, Mahaffey, Schmidt, & Abramowitz, sugg2010). Moreover,
overprotection, lack of warmth/acceptance as well as psychological control have all been reported to be higher in OCD patients compared to healthy controls (Frost, Lahart, & Rosenblate, 1991; Frost, Steketee, Cohn, & Griess, 1994), with the latter showing stronger associations with OC-symptom severity compared to overprotection and lack of warmth/acceptance (Aycicegi, Harris, & Dinn, 2002). In concert, these findings suggest that psychologically controlling parents and parents who exhibit little emotional warmth and acceptance for their children may inadvertently contribute to the pathogenesis of pediatric OCD.

It is currently unresolved whether pediatric TTM is also accompanied by similar familial risk factors as pediatric OCD. The current state of the literature allows reasonable speculation that parents of children with higher levels of TTM will report higher levels of psychological control and lower levels of parental warmth/acceptance. That is, we believe that parental withdrawal, guilt-induction, invalidation, shaming, as well as parental lack of affection and little acceptance may be adversarial in the development of affective self-regulation as it relates to pediatric TTM. Further, we think there to be no significant relationship with pediatric hair pulling and behavioral control.

Expressed Emotion

While parenting is one factor that influences children’s ER abilities, expressed emotion (EE) within the family may be another. EE refers to expression of family member’s attitudes and feelings about an identified patient (Chambless & Steketee, 1999) and is comprised of hostile, blaming, and critical comments (CRIT) and emotional overinvolvement (EOI; Vaughn & Leff, 1976, Thompson, et al., 2010). High CRIT is indicated by high frequency of negative, deficient, and unflattering comments targeted
toward the psychiatric patient. High EOI is characterized by excessive use of praise, excessive details about the past, over-protectiveness, and a strong willingness of self-sacrifice (Shields, 1994; Magnana et al., 1986). EE has been utilized to study family environment risk factors of adult patients (Brown, Birley, & Wing, 1972, Hooley & Teasdale, 1989; Butzlaff & Hooley, 1998) and pediatric patients with different mental health conditions (Greenberg, Seltzer, Hong, & Orsmond, 2006). Moreover, high EE, and specifically high CRIT, is linked to the development and maintenance of pediatric depression (Asarnow, Goldstein, Tompson, & Guthrie, 1993; McCleary & Sanford, 2002) and marked as a possible causal factor in behavioral inhibition in early childhood (Hirshfeld, Biederman, Brody, Faraone, & Rosenbaum, 1997). Relative to pediatric OCD, studies suggest a link between child pathology and high EE. For instance, parents of children with OCD exhibit significantly more EE compared to parents of a healthy control group (Hibbs, Hamburger, Kruesi, & Lenane, 1993). In a more recent study, Przeworski and colleagues (2010) examined the relationship between parent and child EE, symptom severity, and OC-related functioning before and after treatment in 62 parent-child dyads. In the study, higher maternal CRIT, but not EOI, was associated with more severe ratings of pediatric OCD prior to treatment, and rates of EE were higher for OCD-affected children than for their unaffected, age-matched siblings. Further, Moreover, when the researchers compared families with high maternal criticism to families with lower maternal criticism, children facing high maternal criticism had worse post-treatment OCD-related functioning than children facing low maternal criticism (Przeworski et al., 2010).
At this point in time, there is no literature examining the relationship between EE and pediatric TTM. Currently, the only information on family functioning and pediatric TTM is provided by an internet survey study of 133 parent-child dyads (Moore et al., 2012). In asking parents and children to rate views about their family relationships on the normed Family Assessment Measure (FAM; Skinner, Steinhauer, & Sitarenios, 2000), the study revealed a modest correlation between youth self-report ratings of TTM and the affective expression subscale, suggesting that TTM-affected families struggle with content, intensity, and timing of communication relative to emotions (Moore et al., 2012). Findings also indicated comparable levels of negative parental attitudes toward anxious children and higher levels of family impairment specific to involvement and control in TTM sample compared to published norms for cystic fibrosis samples and developmental disability samples suggesting that TTM families endorse more enmeshment or disengagement as well as more difficulty adapting to different demands of daily family functioning (Moore et al, 2012). Moore et al.’s (2012) study provided much needed exploratory assessment of general TTM family functioning. Unfortunately, analyses solely relied on t-tests and z-tests statistics comparing the TTM group to normed ratings of children with medical problems and eating disorders. In building on these findings, we aim to measure more specific constructs that have shown robust associations to similar childhood disorders, such as EE (criticism and emotional overinvolvement) and compare them to healthy control sample.

In sum, it appears that high overall EE relates to more severe symptomatology across several internalizing conditions, whereas specifically CRIT relates to poor functioning in pediatric OCD. Given Katz and Gottman’s (1995) findings demonstrating
the effects of adversarial parent-child relationships on children’s physiological reactivity and vagal-tone (i.e. ER ability) this may not be at all surprising. Applied to TTM, it may be that parents respond highly critical toward their children’s inability to stop pulling out their hair, which in turn may be upsetting and distressing. Given what is known about the regulating function of hair-pulling in TTM, parents may inadvertently worsen their children’s symptoms. It is also possible, however, that some children develop compulsive hair-pulling problems in response to emotionally overinvolved and highly critical, blaming parents. Irrespective of directionality and in consideration of the findings linking EE and high CRIT to OCD, we believe that CRIT is likely to be significantly associated with pediatric hair pulling. However, the current pediatric TTM literature is unequipped to whether this assumption is true.

In order to develop and advance current state of treatment options and potential prevention interventions for children with TTM, it is paramount to provide additional evidence about overall parenting characteristics and behaviors and how they relate to children with chronic and compulsive hair pulling. Additionally, past studies about TTM indicate that hair pulling is associated with affect modulation. However, the literature is currently unable to address whether children with TTM endorse diminished emotion regulation abilities and higher levels of emotional lability relative to normally developing children. To address several gaps in the current TTM literature, we investigated the following hypotheses.

**Hypotheses**

1. We expected parents of children with TTM to report lower levels of ER regulation indexed by the Emotion Regulation Checklist - ER skill subscale
and higher levels of emotional lability/negativity, indexed by the Emotion Regulation Checklist – lability/negativity subscale relative to reports of parents with healthy children.

2. Further, we expected that parents of TTM-affected children to endorse higher levels of expressed emotion (as measured by the FEICS), psychological control (as measured by the Revised Children’s Report of Parenting Behavior Inventory (CRPBI) - psychological control subscale), and lower levels of acceptance/warmth (as indexed by the CRPBI – acceptance/warmth subscale) compared to parents of healthy controls. However, we do not expect the TTM group and the control group to differ on behavioral control (as measured by CRPBI – behavioral control subscale).

3. Parent reported psychological control and warmth/acceptance but not behavior control as measured by the Revised Children’s Report of Parenting Behavior Inventory (CRPBI-30) will predict TTM symptom severity as indicated by the Trichotillomania Scale for Children – Severity Parent Report (TSC-SEV) and TTM impairment as indexed by the Trichotillomania Scale for Children – Impairment Parent Report (TSC-IMP). Specifically, we expect a positive relationship between psychological control and TTM and a negative relationship between warmth/acceptance and TTM.

4. We also investigated emotion regulation variables’ predictive utility relative to TTM. Specifically, we expected that parent-reported child emotion regulation ability as assessed by the Emotion Regulation Checklist (ERC) – ER subscale predicts TTM symptom severity as measured by TTM symptom
severity as indicated by the Trichotillomania Scale for Children – Severity Parent Report (TSC-SEV) and TTM impairment as indexed by the Trichotillomania Scale for Children – Impairment Parent Report (TSC-IMP).

We also expected the emotional lability/negativity as measured by the ERC – negativity/lability subscale to be predictive of TTM-severity and TTM-impairment.

5. Further, we expected that high parent reported overall EE as indicated by the FEICS EOI and CRIT subscale scores is positively related with TTM severity as measured by Trichotillomania Scale for Children – Severity Parent Report (TSC-SEV) and the Trichotillomania Scale for Children – Impairment Parent Report (TSC-IMP).

6. Finally, we investigated whether parent reported psychological control and criticism as measured by the CRPBI-30-PC and the FEICS-CRIT subscales respectively, predict ER skill as indexed by the ERC-ER scale and lability/negativity as measured by the ERC-NEG scales. We expect a positive relationship between the two predictor variables and our outcome variables.

Method

Participants

The current sample consisted of 47 parents or caregivers of children between 10 and 17 years of age. Four subjects were excluded from the analysis due to co-occurring developmental disorders and seven additional participants were excluded as they have not met the age requirements. 27 participants endorsed subclinical or clinical levels of Trichotillomania. The clinical sample was primarily recruited through the
Trichotillomania Learning Center’s (TLC’s) homepage (www.trich.org). Additional recruitment came through the use of social network accounts which were established for this purpose (www.twitter.com/kidtrich and www.facebook.com/kidtrich) and via fliers and online community bulletin boards dedicated to the support and advocacy for Trichotillomania and related pediatric mental health conditions. For compensation, caregivers were offered to participate in a raffle for $25 gift cards. The control sample consisted of 20 parents or caregivers. Control subjects were parents or legal guardians of children 10 to 17 years of age without a history of TTM, anxiety, depression, developmental disorders, or intellectual disability. For recruitment we utilized the Mechanical Turk service (Mturk). Mturk is an online marketplace with an integrated participant compensation system and a large, diverse participant pool which allows researchers to obtain data as reliable as that obtained through traditional methods (Buhrmester, Kwang, & Gosling, 2011). Mturk recruits were paid $.50 for survey completion, which is within the normal limits of compensation for the platform. Demographic information including age, gender, race, ethnicity, and income was obtained as part of the online survey. Information about means, standard deviations, and ethnoracial make up and group differences of the samples are found in Table 1.

Procedure

Caregivers were asked to respond to a variety of questionnaires that are to be accessed through a computer, tablet, or mobile device on the World Wide Web. Caregivers were asked to indicate the age of their child and waive signed consent. Then caregivers provided basic demographic information about themselves and their child
before responding to the measures inquiring about child characteristics, parenting practices, and levels of expressed emotion within the family.

**Measures**

**The Trichotillomania Scale for Children – Parent report (TSC-P, Tolin et al. 2007).** The Trichotillomania Scale for Children (TSC; Tolin, et al., 2008) is available as a child (TSC-C) self-report version and a parent report version (TSC-P) and is comprised of two subscales assessing TTM severity and TTM distress/impairment. TSC severity (TSC-Sev) consists of five items and is operationalized as frequency of hair pulling, quantity of hairs being pulled, and perceived control over hair pulling urges (e.g.: “On most days in the last week, how many hairs did your child pull out”). TSC distress/impairment (TSC-Imp) captures guilt, embarrassment, sadness, and avoidance of social settings in relation to hair pulling and bald patches (e.g.: “How much would your child avoid the activities listed below because he/she was embarrassed about hair pulling or bald patches”). The TSC-P demonstrated moderate correlations with Parent report on child’s anxiety Symptoms (PROCAS) and the Psychiatric Institute Trichotillomania Scale (PITS; Tolin et al., 2007). In a previous study internal consistency for TSC-Sev was acceptable ($\alpha = .71$); TSC-imp ($\alpha = .76$; Tolin, et al., 2008). In our sample, internal consistency for TSC-Sev was moderate ($\alpha = .72$), while demonstrating good internal consistency for TSC-imp ($\alpha = .87$).

**Spence Children’s Anxiety Scale – Parent Report (SCAS; Spence, Barrett, & Turner, 1998).** The SCAS is a 38 self-report or parent-report item measure with items rated on a 4-point Likert scale (0 = Never, 1 = Sometimes, 2 = Often, 3 = Always) yielding a maximum possible score of 114. The SCAS parent report assesses multiple
domains of child anxiety (separation anxiety, social phobia, fear of physical injury, obsessive-compulsive behaviors and concerns, chronic worry, and panic with or without agoraphobic avoidance; Spence, 1998; Nauta et al, 2004). The SCAS-parent scale correlates well with the Child Behavior Checklist – internalizing subscale and accurately distinguishes between children with and without anxiety diagnoses (Nauta et al., 2004). Previous studies reported excellent internal consistency for the total score ($\alpha = .92$; Spence, 1998) In our sample, internal consistency was also found to be excellent ($\alpha = .95$).

**Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997).** The ERC is a 24-item adult-report measuring of children’s emotion regulation abilities. Respondents are asked to rate items on a four-point Likert scale ranging from 1 (Rarely/Never) to 4 (Almost always). The ERC is comprised of lower order constructs measuring emotion regulation skills (ERC-ER) and negativity/lability (ERC-Neg; Shields & Cicchetti, 1997). The ERC-ER subscale captures situationally appropriate displays of affect, empathy, and affect-related self-awareness. Items include “*Can modulate excitement (doesn’t get carried away in high energy situations)*”, “*Can say when s/he is feeling sad, angry, or mad, fearful or afraid*”, and “*Can quickly recover upset or distress (doesn’t pout or remain sullen, anxious or sad after emotionally distressing events)*”. The ERC-Neg scale describes a lack of flexibility, mood swings, and dysregulated emotions. Items include “*Exhibits wide mood swings*” and “*Is prone to angry outbursts*”. In our sample, ERC-ER and ERC-Neg were negatively correlated ($r = -.51$), indicating they assess different constructs. Both scales demonstrated excellent convergence with established and widely used standardized measures (i.e. CBCL) and behavioral measures (Minnesota
Behavior Ratings; Shields & Cicchetti, 1997). Previous studies demonstrated high internal consistency for both subscales (ERC-ER, $\alpha = .83$; ERC-Neg, $\alpha = .96$; Lunkenheimer, Shields, & Cortina, 2007). In our sample both scales delivered good internal consistency (ERC-ER, $\alpha = .81$; ERC-Neg, $\alpha = .89$).

The Revised Children’s Report of Parenting Behavior Inventory (CRPBI-30; Schludermann & Schludermann, 1988) is a 30-item questionnaire adapted from a child self-report intended to measure parenting practices. The CRPBI measures three parenting dimensions yielding three separate scores but no total score: Parental psychological control (CRPBI-PC) captures behaviors consistent with intrusive/authoritarian, enmeshed, and intrusive parenting behaviors (Barber, Olsen, & Shagle, 1994). Parental acceptance/warmth (CRPBI-WA) captures parenting behaviors that are consistent with providing emotional support, favorable acknowledgement and tolerance of children’s psychological experiences. Lastly, behavioral control (CRPBI-BC) describes factors related to child autonomy, behavioral expectations, and parental monitoring (Barber, et al., 1994). Respondents are asked to rate statements such as “I am a parent that is able to make my child feel better when s/he is upset” (warmth/acceptance), “I avoid looking at my child when s/he disappoints me” (psychological control), “I believe in having lots of rules and sticking with them” (behavior control), on a 3-point Likert scale ranging from 0 (“not like me”) to 2 (“a lot like me”). Higher scores indicating greater levels of parental acceptance/warmth, psychological control, or firm control, respectively. Scales correlate well with other measures assessing parental intrusion (Laird, Marrero, Melching, & Kuhn, 2013) psychological and behavioral control (Barber et al., 1994; Delhaye, Beyers, Klimstra, Linkowski, & Goossens, 2012). The CRPBI-30 has demonstrated acceptable
internal consistencies, ranging from $\alpha = .60$ to .78; (Marsac & Alderfer, 2010). Reliability coefficients in our sample for CRPBI-WA was $\alpha = .89$, $\alpha = .79$ for CRPBI-PC, and $\alpha = .60$ for CRBPI-BC.

Family Emotional Involvement and Criticism Scale (FEICS; Shields, Franks, Harp, Campbell, & McDaniel, 1994) is a 14-item scale assessing expressed criticism (CRIT) and emotional involvement (EOI) – two lower order factors of Expressed Emotion (EE). Respondents are asked to rate items such as “If I get upset, people in my family get upset too” (EOI) “My family is always trying to get me to change” (CRIT) on a 5-point Likert scale from 0 (= Almost Never) to 4 (= Almost Always). The FEICS correlates moderately with related constructs measured by Family Adaptability and Cohesion Evaluation Scales (FACES-III; McCubbin, Barnes, Larsen, & Wilson; 1983) and the Family Assessment Device (FAD; Miller, Bishop, Epstein, & Keitner, 1985), as well as anxiety and depression symptoms as assessed by the Symptom Check List-90 (SCL-90). CRIT and EOI subscales have demonstrated adequate to good reliability in a sample of 928 families ($\alpha$s = .82, .74; Shields, Franks, Harp, McDaniel, & Campbell, 2007). In our sample the subscales yielded $\alpha$ values of .62 (EOI) and .74 (CRIT).

Data Analysis Plan

First, data was assessed for normality, multicollinearity, homoscedasticity, and independence of residuals as recommended (Tabachnick & Fidell, 2013). Second, we created correlation matrices for both trichotillomania and control groups and calculated group differences using t-tests and multivariate analyses of variance (Manova) for TTM, parenting, expressed emotion, and anxiety scores. Due to a lack of variance for the trichotillomania (i.e. TSC) measure in the control group, correlations with
trichotillomania scores could not be calculated for the control group. As a result, we proceeded to test regression analyses in the TTM group exclusively. Linear and multiple regression analyses were calculated to investigate whether parenting, emotion regulation, and expressed emotion variables predict TTM severity and a final multiple regression was calculated using psychological control and criticism to predict emotion regulation.

A power analysis, using G Power software 3.1.2 indicated that in order to obtain a large ($f^2 = .35$) to medium ($f^2 = .15$) effect size and an alpha coefficient of .05, a sample size between 48 and 89 would be required for hypotheses 1 and hypothesis 4. For hypotheses 2 and 3 a sample size between 40 and 89 would be required in order to obtain between a large ($f^2 = .35$) and medium ($f^2 = .15$) effect size, yielding a recommended sample size between 48 and 89 participants for regression analyses. Our current total sample included 47 participants. The TTM sample consists of 27 participants.

**Missing Data**

Due to the frequency of missing data points for single items we performed multiple imputation. Multiple imputation is a flexible approach for handling missing data that proceeds by replicating an incomplete dataset multiple times and replaces missing data in each replicate with plausible values that are drawn from an imputation model. In a final step, a single pooled multiple imputation value was produced by combining the estimates and standard errors obtained from each completed dataset (Rezvan, Lee, & Simpson, 2015).

**Results**

Table 1 presents demographic information about TTM and control group. Chi-square and Fisher’s exact tests revealed no significant group differences between the
clinical and the control samples relative to gender \( \chi^2 (1, N = 47) = .41, \) phi = .14., race \( p = .61, \) and age \( p = .87. \) However, groups differed based on income with the control group earning significantly less per year \( (p = .04), \) with 70% of controls earning less than $80,000 annually and 70% of the Trichotillomania sample reporting an annual income of $80,000 and above. An independent t-test revealed that the trichotillomania group \( (M = 26.03, SD = 15.90) \) endorsed significantly higher levels of anxiety than the control group \( (M = 8.20, SD = 4.87), t(47) = 4.84, p < .001. \) The magnitude of the mean differences was small \( (\eta^2 = .20). \) 81% of our TTM sample had contact with a service provider at least once. Means and standard deviations of psychopathology, parenting variables, and expressed emotion are listed in Table 2. Control group average scores are commensurate to other healthy control samples relative to anxiety scores \( (Nauta et al., 2004), \) parenting \( (Forehand & Nousiainen, 1993). \) Similar to previous reports, our sample used acceptance/warmth and behavior control more frequently than psychological control \( (Forehan Nousiainen, 1993). \) In contrast, control group mean scores on the FEICS were elevated and comparable to those found in families with a member suffering from an eating disorder \( (Medina-Pradas, Navrro, Lopez, Grau, & Obiols, 2011). \)

Tables 3 presents bivariate intercorrelations between psychopathology, parenting, and expressed emotion measures in Trichotillomania and the control group. Broadly, correlations in the control group are corresponding in degree and pattern to those in similar samples \( (Sheffield-Morris et al., 2007; Eisenberg & Sulik, 2012), \) evidencing significant correlations in the expected directions between anxiety scores and emotion regulation skills, expressed emotion scores, and the criticism subscale as well as a negative association between warmth/acceptance and criticism. In our Trichotillomania
Hypothesis 1: First, a MANOVA was performed to compare groups on emotion regulation. There was a statistically significant difference between trichotillomania and control groups on the combined dependent variables of emotion regulation skills and negativity/lability $F(1,41) = .24$, $p < .006$ Wilk's $\Lambda = 0.73$, partial $\eta^2 = .27$. When the results for the dependent variables were considered separately, significant effects were observed for emotion regulation skills, $F(1,43) = 8.40$, $p < .01$, partial $\eta^2 = .17$; and negativity/lability $F(1,42) = 14.38$, $p < .001$, partial $\eta^2 = .26$, indicating that controls scored significantly higher on emotion regulation skills and significantly lower on negativity/lability relative to the Trichotillomania group.

Hypothesis 2: Second, we performed a MANOVA to test whether the Trichotillomania group evidenced high scores on expressed emotion, psychological control, and lower scores on warmth/acceptance. Contrary to expectation, results revealed no significant multivariate between group differences relative to expressed emotion, $F(1,43) = .24$, $p = n.s$. Wilk's $\Lambda = 0.95$, partial $\eta^2 = .05$, as well as no significant univariate between-group effects relative to criticism and emotional overinvolvement. Another MANOVA was performed to test whether groups differed in regards to
parenting practices. Three dependent variables were used: psychological control, warmth/acceptance, and behavior control. Results from this MANOVA demonstrated non-significant between-group differences $F(1,44) = 1.71$, $p = .18$. Wilk's $\Lambda = 0.89$, partial $\eta^2 = .11$. Univariate results for this relationship demonstrated a non-significant effects for acceptance/warmth score, $F(1, 44) = 1.79$, $p = .18$ and behavior control, $F(1, 44) = .94$, $p = .33$, while psychological control was trending toward significance $F(1, 44) = 1.84$, $p = .08$.

**Hypothesis 3:** As for reasons stated above, we performed the following regression analyses in the TTM group exclusively. First, we performed a multiple linear regression analysis to test our hypothesis that psychological control, as indexed by the CRPBI-PC, and warmth/acceptance, as indexed by the CRPBI-WA, but not behavior control (CRPBI-BC), predicted TTM severity indicated by the TSC -severity scale. This analysis was found to be statistically significant $F(3, 27) = 3.79$, $p < .05$. This multiple regression accounted for 18% of the variability, as indexed by the adjusted $R^2$ statistic. The variable of acceptance/warmth, as indexed by its $\beta$ value of $0.48$, $p < .05$ was shown to have a stronger relationship to trichotillomania than psychological control ($\beta = .29$, $p = .13$) and behavioral control ($\beta = .08$, $p = .42$). In investigating the relationships between our predictor variables and TTM impairment, as indicated by the TSC Impairment scale a multiple regression found that parenting did not predict TTM impairment $F(3, 27) = 1.40$, $p = .27$.

**Hypothesis 4:** We proposed that emotion regulation will predict trichotillomania severity as measured by the TSC. To examine this relationship, we performed a two multiple regressions to examine the relationships between our emotion regulation
constructs (emotion regulation skill and negativity/lability) and Trichotillomania severity and Trichotillomania impairment. Contrary to expectation, neither, TTM severity $F(2, 27) = .62, p = .55$, nor TTM impairment $F(2, 27) = .01, p = .99$ were predicted by emotion regulation.

**Hypothesis 5:** To test if Trichotillomania could be predicted as a function of expressed emotion (EE), we performed a number two multiple regression analyses with EE as the predictor and TTM as the criterion. Using the FEICS-EOI and FEICS-CRIT as the predictor variables and the TSC-Sev score as the dependent variable, the analysis was nonsignificant $F(2, 27) = .74; p = .48$. When investigating the relationship of EOI and CRIT and TTM impairment, results were also non-significant $F(2, 27) = 2.44; p = .11$.

**Hypothesis 6:** Finally, to examine hypothesis 6, two multiple linear regressions were conducted to examine whether psychological control (CRPBI PC) and criticism (FEICS CRIT) significantly predict emotion regulation skills (as indicated by ERC-ER) and negativity/lability (as indicated by ERC-Neg). Contrary to a priori conceptualization neither of these regressions were found to be significant, indicating no linear relationship of psychological control and criticism with negativity/lability $F(2,27) = 1.38; p = .27$ and no significant predictive relationship between psychological control and criticism and emotion regulation skills $F(2,27) = 1.02; p = .37$.

**DISCUSSION**

The results of the present study should be interpreted with caution and be considered as preliminary due to the small sample size and lack of variance on TTM scores in the control sample. That being said, should these results be confirmed by
analyses with a larger and more variable sample, the current results provide meaningful contributions to the existing literature about pediatric TTM.

To our knowledge, this study is the first to investigate general functioning concerning emotion regulation ability and emotional lability in a pediatric trichotillomania sample by comparing them to a normative group. Previous work noted that hair pulling may serve to modulate emotion states across the arc of a pulling session. Our preliminary findings indicate that children with hair pulling generally exhibit more mood swings, more negativity, less affect-related self-awareness and other-awareness, and greater difficulty displaying appropriate behaviors when they are emotionally aroused than healthy control subjects. Contrary to our prediction, however, we found the severity of emotional lability and emotion regulation skills to be unrelated to the severity of Trichotillomania in the clinical group. Regarding parenting, we found no significant differences between parents of Trichotillomania-effected children and parents of healthy, well-adjusted children. Interestingly, though, parental warmth/acceptance was inversely related to Trichotillomania severity in children with Trichotillomania. That is, when parents display greater emotional support and greater levels of non-judgmental acknowledgment of their children’s emotions, children with hair pulling endorse greater levels of control over pulling urges and show lower frequencies of pulling. As expected, parental monitoring (behavior control) showed no relationship to Trichotillomania. However, contrary to our expectation, parental psychological control and expressed emotion (i.e. criticism, emotional overinvolvement) provided no predictive utility in predicting Trichotillomania in clinical group.
Regarding emotion regulation, we found significant differences between the clinical and control groups. Per the parent’s reporting, children with Trichotillomania evidenced substantially greater difficulty regulating affect and endorsed much greater levels of emotional lability compared to our control group. These results are in line with Shusterman’s (2009) proposed affect-regulation model of TTM, which suggested that compulsive hair pulling may be in part explained by a general deficit in emotion regulation and emotional volatility. However, contrary to a priori conceptualization, we did not observe a relationship between the severity of emotion dysregulation and TTM symptom severity in children with TTM. This is inconsistent with reports about adults with pathological skin-picking, a related OC-spectrum disorder (Snorrason, Smári, & Olafson, 2010). Also, given that the existing literature suggest that hair pulling serves as an emotion regulation strategy, we expected to find a positive linear relationship between severity of emotional dysfunction and hair pulling severity. Surprisingly, our results did not confirm this, presumably as a result of the ER scores’ small variance in the Trichotillomania group.

Although our study’s results regarding ER in children with Trichotillomania support the view that this disorder is in part explained by substantial deficits in affect regulation, it is currently not clear why children with Trichotillomania experience such difficulty regarding their emotional functioning. It is possible that children with hair pulling may experience emotions more intensely than non-pulling children do, and, as a consequence, find them harder to cope with. Correspondingly, although the evidence in the current literature is sparse, it is reasonable to suggest that neurophysiological differences may explain elevated emotion dysregulation as well as difficulties with
dysfunctional neurophysiological mechanisms related to inhibitory functions explain difficulties with modulating and inhibiting distress and fears and the repetitive behaviors accompanied aimed at alleviating anxious distress (Bannon, Gonsalvez, Croft, & Boyce, 2002; Maia, Cooney, & Peterson, 2008; Comer et al., 2004). Another possibility may be that ER deficits and negative affect are related to the high presence of co-occurring anxiety and other co-morbid disorders (Shusterman et al., 2009).

Multiple investigators have reported poor emotion regulation in other common childhood disorders, such as childhood anxiety (Suveg & Zeman, 2004; Carthy, Horesh, Apter, Edge & Gross, 2010), pediatric OCD (Przeworski et al., 2010). Nonetheless, taken together, our data supports the notion that affective processes and ER play a prominent role in TTM and related disorders (Shusterman et al., 2009; Snorrason, Smári, & Ólafsson, 2010). Future work should include multi-modal assessment to examine emotion regulation skills and include physiological measures of emotional reactivity to unpack affective processes related to childhood TTM. Investigators should also replicate previous studies with adults to address affective changes across the span of a hair pulling session and strive to disentangle the intensity of emotions from the poor emotion regulation with the aim to inform treatments accordingly.

The current results indicate that there was no significant difference between TTM affected families and healthy controls with regard to parenting variables. However, when examining group differences individual parenting variables, we observed a trend toward significance relative to psychological control indicating that parents with hair pulling
children may use more invalidating, manipulative, and constraining statements and behaviors toward their children’s emotional expression and experience. Particularly, given our small sample size, we are unable to confidently make predictions about statistical trends. Additionally, we observed that some parenting practices were predictive of TTM severity in parents of children with TTM, but not TTM related impairment. In detail, our results indicate that higher levels of parental emotional support, positive regard, and non-judgmental, non-manipulative interactions are associated higher perceived control over hair pulling urges and lower frequency of hair pulling.

This is in line with the literature on emotion socialization, which suggests that children who receive more emotional support and are exposed to more parental acceptance regarding negative emotional experience and unpleasant emotional displays, children develop more adaptive ways of coping with dysregulated emotions and endorse more adaptive behavior (Shaffer et al., 2012; Eisenberg, Cumberland, & Spinrad, 1998). Similarly, other work suggests attenuating effects of high parental warmth and acceptance relative to negative child affective arousal, noting that parental warmth positively relates to emotion regulation ability (Morris et al., 2007). For instance, if the parent provides unconditional approval of their child while utilizing negative experiences as viable learning experience, children endorse less physiological arousal and more effective behavioral coping strategies over time (Gottman, Katz, & Hooven, 1996). Conversely, when parents show judgmental, dismissive reactions during periods of negative arousal, maladapted children struggle more with modulating unwanted, negative emotions in later stages of their life (Gottman et al., 1996). Similarly, developmental
psychopathology studies also corroborate that maternal invalidation and diminishing behaviors toward an adolescent’s affective displays are related to poor ER strategies in adolescents, which in turn are related to higher depressive symptoms (Yap, Allen, & Ladouceur, 2008). It is possible, that ER skills moderated the relationship between child dysregulation and psychological control, suggesting that high parental warmth/acceptance has a meaningful attenuating effect on children with greater emotion regulation difficulty compared to children who have higher levels of emotion regulation abilities (Cui, Morris, Criss, Houltberg, & Silk, 2014).

In applying these findings to our data and pediatric TTM, it is possible that while parenting behavior may not be particularly more toxic in TTM afflicted families compared to healthy control families, positive parenting behavior may provide protective, attenuating effects on hair pulling in children. Currently, the literature is unclear whether lack of parental warmth/acceptance and devaluing parenting behaviors precede hair pulling in children, or if deleterious parenting occurs in reaction to children’s inability to control hair pulling urges and impulses. Longitudinal study designs should be able to detect directional effects in this regard.

To our knowledge, no study investigated behavioral control in child OCD or related disorders to date. In accordance with our expectations, there was no meaningful difference between TTM and control groups on behavioral control, suggesting that parents of children with TTM are not stricter or more intrusive nor are they more permissive or inconsistent in monitoring behaviors of their offspring than healthy control families. Also in line with our prior conceptualization, behavior control also showed no linear relationship to TTM severity or TTM impairment, indicating that parental
expectations, monitoring, and parenting consistency is not related to child TTM, paralleling findings in the child anxiety literature (Barber et al., 2005). Though reports about family functioning in pediatric TTM suggested higher than average levels enmeshment and disengagement, Moore et al.’s (2009) findings suggest that TTM-afflicted families’ struggles may be more prominent around effective communication and the content and intensity of communication around affect, rather than unreliable, laissez-fair or excessive parental monitoring.

To our surprise, TTM impairment was unrelated to lack of warmth/acceptance and psychological control in our study. It is possible that TTM severity is easier for parents to report on than items assessing TTM distress/impairment. While hair pulling severity and its consequences (e.g. missing eye brows, or scalp hair, accumulation of pulled hair in various living settings) are rather easily observable and objective, they may also be more difficult to hide from the parents’ view as hair pulling is difficult to control and frequently occurs outside the patient’s awareness (Flessner et al., 2008). Conversely, TTM impairment may be more difficult to observe for parents as they capture more abstract phenomena (i.e. embarrassment, guilt related to hair pulling). Impairment/distress items may reflect child behaviors that occur outside of parents’ immediate environment. For instance, avoiding social settings away from home like not going swimming with friends or not attending school dances because of bald patches and hair pulling. While this may be a general factor to consider, it may be particularly salient in the context of assessing dismissive, invalidating or non-validating parenting behavior (“I am less friendly with my child, if it does not see things my way”, “If my child hurts me, I stop talking to him/her until he/she pleases me again”) that is absent of or low in
emotional warmth and support (“I am able to make my child feel better when he/she is upset.”, “I often praise my child.”). That is, providing supportive, non-manipulative emotional support likely requires strong parental awareness and emotional intelligence in order to detect and appropriately understand subtle indications about children’s emotional needs. It follows, that if parents are less adept in detecting their child’s distress and provide adequate subsequent emotional support, they may also be less sensitive to reporting about latent psychological and behavioral factors in relation to child TTM impairment.

Given that the vast majority of participants were recruited through the Trichotillomania Learning Center, it is reasonable to expect that children and families were exposed to several adaptive and compensative strategies that lessened the psychological impact that chronic, compulsive hair pulling has on daily functioning. For example, parents of youth with TTM may use various fashion items (e.g. hats, headbands, swim caps) and/or cosmetic strategies (e.g. eye brow fillers, applicable eye lashes) as well as several hair styling solutions by TTM-specialized hair salons in order to compensate for various issues related to TTM and potential negative social consequences. Additionally, we also suspect that parental observations about how much time TTM-affected children require to compensate for TTM-related aesthetic issues may be a function of increasing levels of independence. That is, as children progress through puberty, compensatory hygiene routines and grooming behaviors are likely performed under decreasing levels of parental awareness and supervision. Relatedly, while it is may be difficult to hide or deny direct hair pulling behaviors for reasons stated above, it is reasonable that it may be more challenging for parents to attribute socially avoidant
behaviors and negative psychological consequences to hair pulling behaviors specifically, as children could easily provide different, innocuous reasons and explanations for their behaviors. In other words, while it possible that a child with TTM is likely to avoid socializing with others because they feel uncomfortable about their hair, they could easily tell their parents that they are busy with school work, that they feel sick, or that they are sad about something entirely unrelated to hair pulling. Taken together, any combination of listed potential factors along with our small sample size likely accounts for the insignificance of these findings.

To our surprise, the TTM and healthy control groups did not differ in expressed emotion variables, suggesting that TTM-affected parents do not express significantly more criticism and emotional overinvolvement than families of children with no psychopathological impairment. Expressed emotion (CRIT and EOI) failed to predict TTM symptom severity and TTM-related impairment in our sample. Similarly, criticism and psychological control were also not predictive of associated with emotion regulation skills or emotional lability/negativity. Given that the literature in childhood psychiatric disorders suggests that families of children with mental illness express higher numbers of criticism compared to healthy controls (Hibbs, et al., 1991; Hibbs, Zahn, Hamburger, Kruesi, & Rapoport, 1992), we were surprised to find no meaningful difference in expressed emotion among the study groups. In particular, we expected higher levels of EE as previous evidence suggests that TTM affected families endorse elevated levels of negative attitudes and difficulties with effective communication, involvement, and adjusting to different demands of daily life (Moore et al., 2009). It should be noted, however, that when the sample was divided into high and low severity groups, elevated
family conflict and disagreements were only evident in high severity TTM group (Moore et al., 2009). Although it is possible that EE is not an important factor in our sample, it may be that we would see significant results in a subgroup of high EE families.

A closer look at the OCD literature also suggests a similar, more complex relationship between critical parenting and child pathology. While family functioning, including blaming and criticism have been emphasized in the pediatric OCD literature (Peris et al., 2012; Salkovskis, Shafran, Rachman, & Freeston, 1999), theory and research suggests that severely harsh criticism and overinvolved, overprotective parenting may be a low base rate phenomenon, which, when present, shows robust detrimental effects on symptom severity (Hinrichsen & Pollack, 1997), treatment dropout and post-treatment functioning (Chambless & Steketee, 1999; Przeworski et al., 2011), whereas effects of lower levels of criticism on functioning and symptom severity are smaller or non-significant (Przeworski et al., 2011). Not surprisingly, studies frequently examine these variables by dividing reported scores into high and low severity groups for analysis (Przeworski et al, 2011; Morris et al., 2007). Given our small sample size, we were unable to perform our analyses in this manner.

While we hypothesized, based on reports in the OCD literature, that TTM affected families would evidence more high EE and that EE would be predictive of TTM, there may be salient differences between the nature and presentation of the two disorders, which could explain our results. To elaborate, manifestations of child OCD compared to childhood TTM likely have very different sets of challenges for caregivers and family members. That is, OC symptoms are often extremely pervasive (Mataix-Cols, Nakatani, Micali, & Heyman, 2008; Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989) and
vastly alter daily family interactions, family communication, and family rituals in an attempt to accommodate the OCD patient. The result is that caregivers and other family members frequently face a significant reorganization of family customs and daily habits (Waters & Barrett, 2000), which in turn propagate higher levels of family conflict, parenting distress, harsh criticism as family members (Storch, Lehmkuhl, Pence, Geffken, Rickets, et al., 2009; Steketee, 1993) in an effort to restore family harmony while controlling the intrusive nature of obsessive compulsions (Storch et al., 2009; Waters & Barrett, 2000). Conversely, the symptom presentation in TTM is likely to be less disruptive to established family structure and communication patterns, given that cardinal symptom presentation is focused on the patient’s own body rather than their environment as it is in OCD.

Lastly, it may be that our measures’ psychometric properties may be suboptimal. Despite correlating well with established self-report family measures such as the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portner, & Lavee, 1985) and the Family Assessment Device (FAD, Epstein, Baldwin, & Bishop, 1995), the FEICS’ criticism subscale correlation with a well-established behavioral measure of EE, the five-minute speech sample (Magana, Goldstein, Karno, Miklowitz et al., 1986) was significant but small ($r = .31$), while the emotional overinvolvement subscale failed to evidence a significant correlation with the FMSS (Restrepo et al., 2004). This raises questions about the validity of the FEICS as an instrument to assess EE. Future studies will benefit from using open ended coded behavioral observation (i.e. five-minute speech sample, Magana et al., 1986) or interviewing instruments (i.e. Camberwell Family
Interview; Brown, Birley, & Wing, 1972) to examine involvement and criticism in TTM-affected families.

It is important to note that our clinical sample has been primarily recruited through the Trichotillomania Learning Center (TLC). The TLC is the world’s leading advocacy and funding agency for TTM and currently the primary educational resources for lay people and patients. It features a vast online resource database of educational materials and therapist’s databases for adults, children and family members who live with someone that suffers from TTM as well as online discussion and support groups and consequently been exposed to considerable amounts of psychoeducational material. In this context, 81% of our clinical sample had previous contact with service providers at least once prior to answering our survey. Additionally, our clinical sample also reported considerable higher income than our control sample with almost 90% of families reporting annual household income above the national average (DeNavas-Walt, Proctor, & Smith, 2014). Considering that higher SES and greater access to resources and education have been linked to protective effects for health and mental health outcomes (Adler, Boyce, Chesney, Cohen, Folkman, et al., 1994; Taylor & Stanton, 2007), it stands to reason that our clinical sample has benefitted from previous encounters with mental health providers, educational and financial resources, which in turn may have increased the participants’ understanding of TTM and possibly consequently fostered more adaptive and effective parenting relative to their children.

**Limitations.** As stated above, our results should be interpreted with caution and several, considerable limitations in mind. First, although our sample size is proportionate to other TTM studies, statistical power is insufficient for the regression analyses used in
this manuscript. Second, our samples were recruited over the Internet. Online recruitment is an inexpensive to obtain data and useful for studying low base rate disorders, such as pediatric TTM. However, there are reasonable concerns relative to data quality when relying solely on Internet samples in clinical research. Third, there are a number of limitations pertaining to measurement. Our study relied on parent reported questionnaire data only. Some parents may be unaware about their parenting behaviors and others may underreport being critical, manipulative, or devaluing toward their offspring, particularly when their child struggles with psychological problems. Even though, there are indications that parent collateral information is more reliable than child reported data (Sherifali & Pinelli, 2007), complementary approaches, using parent and child, and even teacher data together are preferable, as child behaviors are commonly different across settings. Consequently, to illuminate potentially etiologically relevant factors, it is recommended to use cross-informant clinical data (Achenbach, 2006; De Los Reyes & Kazdin, 2005). In addition, our study did not employ clinical semi-structured interviews to confirm diagnostic status of our sample. Thus, we cannot confirm the diagnostic status of the subjects in this sample. Moreover, although our measure of expressed emotion performed with acceptable reliability, there are superior tools for the assessment of this construct. Notably, future studies may use clinical interview measures (Brown, Birley, & Wing, 1972;) or behavioral measures (Magan, Goldstein, Karno, Miklowitz et al., 1986). In concert, multi-informant data, clinical interviews, and stronger measures would augment the reliability and validity of our reported results.

Lastly, readers are advised to consider the differences between the two groups in our study. The control group indicated significantly less annual income compared to the
clinical sample. Given that lower income is strongly related to socio economic status (Feinstein, 1993) and both variables are, in turn, positively related to poorer family adjustment and mental health outcomes (Blau, 1999; McLoyd, 1998), it is possible that the non-significant between-group differences relative to parenting and expressed emotion are not truly representative. That is, our control sample may exhibit somewhat greater maladaptive parenting than is representative. In concert with the fact that our clinical sample’s annual income was higher than the national average, measureable between-group effects may have been eliminated. Future studies will benefit from recruiting samples with comparable demographic characteristics.

Conclusion

As stated above, the results of our study should be considered tentative. The preliminary results suggests that children with TTM show greater difficulty with regulating unwanted emotional experience and experience more emotional lability than children without mental health or behavior problems. To our knowledge, this is the first study to target specific parenting behaviors and expressed emotion in families of children with TTM. Thus far, the data suggests that some parenting behaviors (warmth/acceptance, psychological control) may predict hair pulling severity but not impairment. Going forward, the impact of such parenting factors, particularly emotionally supportive parent behaviors, deserve additional attention in research. Other parent behaviors (behavioral control) appear to play no significant role in pediatric TTM. Further, though the data indicates no meaningful differences between TTM families and healthy controls relative to criticism and emotional overinvolvement (EE), we are unable to make definitive statements about these results for a number of reasons. It is possible
that the relationship between EE and TTM is more complex and possibly moderated by other variables, such as severity of EE and child ER skills. Future research will be needed to unpack these relationships.

Should our preliminary findings be confirmed in a larger sample, our study may have implications for the treatment of pediatric TTM. Guiding theoretical perspectives in the treatment of TTM are primarily based on behavioral principles (i.e. Habit Reversal Therapy; Azrin & Nunn, 1974), however, the results regarding emotional functioning in the TTM group suggest that targeting effective coping skills and emotion regulation strategies may provide worthwhile additions in treating pediatric TTM. Additionally, while we cannot claim that TTM-affected families differ from healthy control families in relation to affective climate and parenting behaviors, it may also be helpful to assess parenting behaviors and possibly intervene on the family level when appropriate. Specifically, service providers may target emotionally supportive, non-judgmental parenting strategies. Future research will need to evaluate whether improving emotion regulation skills and increasing positive parenting strategies truly augment traditional forms of behavior treatment for compulsive hair pulling in children.
Appendix

Table 1

Demographic Information about Trichotillomania and Control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Trichotillomania</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td>27</td>
<td>12.9</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
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<tr>
<td>Female</td>
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<td>13</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>African Am</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>White</td>
<td>23</td>
<td>85.2</td>
</tr>
<tr>
<td>Biracial/Other</td>
<td>2</td>
<td>7.4</td>
</tr>
</tbody>
</table>
Table 2

Summary of Means, Standard Deviations, between-group differences for Trichotillomania and Control groups (N = 47)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Trichotillomania</th>
<th>Control</th>
<th>p</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TSC Sev</td>
<td>1.50 (.34)</td>
<td>.00 (.00)</td>
<td>.001**</td>
<td>.91</td>
</tr>
<tr>
<td>2. TSC Imp</td>
<td>1.03 (.51)</td>
<td>.02 (.00)</td>
<td>.001**</td>
<td>.91</td>
</tr>
<tr>
<td>3. SCAS</td>
<td>28.18 (16.66)</td>
<td>8.91 (5.14)</td>
<td>.001**</td>
<td>.20</td>
</tr>
<tr>
<td>4. ERC Neg</td>
<td>31.31 (6.85)</td>
<td>22.85 (6.55)</td>
<td>.05*</td>
<td>.17</td>
</tr>
<tr>
<td>5. ERC ER</td>
<td>22.99 (3.31)</td>
<td>26.70 (4.09)</td>
<td>.01**</td>
<td>.26</td>
</tr>
<tr>
<td>6. CRPBI PC</td>
<td>13.89 (2.94)</td>
<td>12.89 (2.94)</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>7. CRPBI WA</td>
<td>26.04 (4.59)</td>
<td>27.45 (2.72)</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>8. CRPBI BA</td>
<td>21.11 (2.28)</td>
<td>21.84 (2.83)</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>9. FEICS</td>
<td>23.62 (4.94)</td>
<td>19.81 (5.25)</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>10. FEICS-EOI</td>
<td>15.12 (3.51)</td>
<td>14.16 (3.25)</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>11. FEICS-CRIT</td>
<td>6.50 (2.58)</td>
<td>6.05 (4.55)</td>
<td>.18</td>
<td></td>
</tr>
</tbody>
</table>

For ERC higher scores indicate higher overall Emotion Regulation scores. For all other scales higher scores indicate more extreme responding in the direction of the construct assessed. TSC = Trichotillomania Scale for Children – Parent report, TSC Sev = Severity subscale, TSC Imp = Impairment subscale. SCAS = Spence Children’s Anxiety Scale; ERC = Emotion Regulation Checklist, ER = Emotion Regulation skills subscale, Neg = Negativity/Lability; CRPBI – PC = Parental Psychological Control, CRPBI – WA = Parental Warmth/Acceptance, FEICS = Family Emotional Involvement and Criticism Scale, FEICS-CRIT = FEICS Criticism, FEICS-EOI = FEICS Emotional Overinvolvement. ** $p < .01$, * $p < .05$
### Table 3

Summary of bivariate Intercorrelations for scores on Trichotillomania, Anxiety, Parenting, and Expressed Emotion measures.

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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</thead>
<tbody>
<tr>
<td>1. TSC</td>
<td>-</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
</tr>
<tr>
<td>2. TSC Imp</td>
<td>.86**</td>
<td>-</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
</tr>
<tr>
<td>3. TSC Sev</td>
<td>.83**</td>
<td>.44*</td>
<td>-</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
<td>g</td>
</tr>
<tr>
<td>4. SCAS</td>
<td>.08</td>
<td>.21</td>
<td>-.09</td>
<td>-</td>
<td>-.37</td>
<td>-.49*</td>
<td>.06</td>
<td>.12</td>
<td>-.27</td>
<td>.69**</td>
<td>.10</td>
<td>.53*</td>
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<tr>
<td>5. ERC Neg</td>
<td>-.13</td>
<td>-.12</td>
<td>-.16</td>
<td>.53**</td>
<td>-</td>
<td>-.68**</td>
<td>.07</td>
<td>-.52*</td>
<td>.22</td>
<td>.20</td>
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<tr>
<td>6. ERC ER</td>
<td>.22</td>
<td>.09</td>
<td>.28</td>
<td>-.32</td>
<td>-.51**</td>
<td>-</td>
<td>-.21</td>
<td>.38</td>
<td>.39</td>
<td>-.44</td>
<td>-.07</td>
<td>-.43</td>
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<tr>
<td>7. CRPBI PC</td>
<td>-.31</td>
<td>-.11</td>
<td>.44*</td>
<td>.23</td>
<td>.32</td>
<td>-.32</td>
<td>-</td>
<td>-.10</td>
<td>-.27</td>
<td>-.31</td>
<td>.16</td>
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<td>8. CRPBI WA</td>
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<td>-.05</td>
<td>-.14</td>
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<td>-.16</td>
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<td>.34</td>
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<tr>
<td>9. CRPBI BC</td>
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<td>-.01</td>
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<td>.00</td>
<td>-</td>
<td>-.27</td>
<td>.47*</td>
<td>.00</td>
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<tr>
<td>10. FEICS TOTAL</td>
<td>-.11</td>
<td>-.22</td>
<td>.04</td>
<td>.35</td>
<td>-.02</td>
<td>.14</td>
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<td>.01</td>
<td>.01</td>
<td>-</td>
<td>.57**</td>
<td>.78**</td>
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<tr>
<td>11. EOI</td>
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<td>-.13</td>
<td>-.22</td>
<td>.38*</td>
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<td>.38</td>
<td>.34</td>
<td>.46**</td>
<td>-</td>
<td>.08</td>
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<tr>
<td>12. CRIT</td>
<td>.06</td>
<td>.13</td>
<td>-.26</td>
<td>.48**</td>
<td>.17</td>
<td>-.22</td>
<td>.54**</td>
<td>-.30</td>
<td>-.09</td>
<td>.57**</td>
<td>-.44*</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Intercorrelations for Trichotillomania sample (n = 27) are presented below the diagonal and intercorrelations for control group (n = 20) are displayed above the diagonal. * = No variance; correlation could not be computed because at least one variable is constant. For all scales higher scores indicate more extreme responding in the direction of the construct assessed. TSC = Trichotillomania Scale for Children – Parent report, TSC Sev = Severity subscale, TSC Imp = Impairment subscale. SCAS = Spence Children’s Anxiety Scale; ERC = Emotion Regulation Checklist, ER = Emotion Regulation skills subscale, Neg = Negativity/Lability; CRPBI – PC = Parental Psychological Control, CRPBI – WA = Parental Warmth/Acceptance, FEICS = Family Emotional Involvement and Criticism Scale I, CRIT = Criticism, EOI = Emotional Overinvolvement.
Table 4

*Prediction of Trichotillomania Severity and Trichotillomania Impairment*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>Tolerance</th>
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<td><strong>Trichotillomania Severity</strong></td>
<td></td>
<td></td>
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<tr>
<td>Emotion Regulation Skills</td>
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<td>.01</td>
<td>.18</td>
<td>.73</td>
</tr>
<tr>
<td>Negativity/Lability</td>
<td>.01</td>
<td>.02</td>
<td>.05</td>
<td>.73</td>
</tr>
<tr>
<td>Psychological Control</td>
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<td>.02</td>
<td>.29</td>
<td>.89</td>
</tr>
<tr>
<td>Warmth/Acceptance</td>
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<td>.02</td>
<td>-.48*</td>
<td>.93</td>
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<tr>
<td>Behavioral Control</td>
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<td>.03</td>
<td>-.08</td>
<td>.95</td>
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<tr>
<td>Criticism</td>
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<td>.01</td>
<td>.92</td>
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<tr>
<td>Emotional Overinvolvement</td>
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<td>.02</td>
<td>.02</td>
<td>.92</td>
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<td><strong>Trichotillomania Impairment</strong></td>
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<td>.02</td>
<td>-.01</td>
<td>.73</td>
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<tr>
<td>Negativity/Lability</td>
<td>-.01</td>
<td>.02</td>
<td>-.02</td>
<td>.73</td>
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<tr>
<td>Psychological Control</td>
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<td>.04</td>
<td>.12</td>
<td>.89</td>
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<tr>
<td>Warmth/Acceptance</td>
<td>.02</td>
<td>.27</td>
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<td>.93</td>
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<tr>
<td>Behavioral Control</td>
<td>.07</td>
<td>.04</td>
<td>.32</td>
<td>.95</td>
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<tr>
<td>Criticism</td>
<td>.03</td>
<td>.02</td>
<td>.38</td>
<td>.96</td>
</tr>
<tr>
<td>Emotional Overinvolvement</td>
<td>.01</td>
<td>.02</td>
<td>.09</td>
<td>.96</td>
</tr>
</tbody>
</table>

*Note:* *p < .05.*
Table 5

*Prediction of Emotion Regulation in Trichotillomania group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE$ $B$</th>
<th>$\beta$</th>
<th>Tolerance</th>
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<tr>
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<td>.82</td>
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<tr>
<td>Criticism</td>
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<td>-.02</td>
<td>.82</td>
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<tr>
<td><strong>Negativity/Lability</strong></td>
<td></td>
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<tr>
<td>Psychological Control</td>
<td>.73</td>
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<td>.31</td>
<td>.82</td>
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<tr>
<td>Criticism</td>
<td>.05</td>
<td>.40</td>
<td>.03</td>
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