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# Affective regulation in trichotillomania before and after self-help interventions



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#### ABSTRACT

*Objective*: Trichotillomania (TTM) is characterized by recurrent hair-pulling behaviours that cause significant distress. Deficits in affective regulation have been reported in individuals with TTM. We aimed to investigate temporal stability of affective regulation in TTM individuals.

Methods: Eighty-one TTM individuals underwent an online intervention. Affective Regulation Scale (ARS), Massachusetts General Hospital Hair-Pulling Scale (MGH-HPS), and Beck Depression Inventory (BDI) scores were obtained at baseline, post-treatment (4 weeks), and follow-up (6 months). We examined the effect of phenotypes including hair-pulling severity and depressive symptoms on absolute and relative stability of affective regulation over time, using multiple linear and hierarchical regression analyses.

Results: The ARS total-score from the present TTM sample was significantly lower than the score from non-hair pullers (p < 0.001). ARS total-scores inversely correlated with the MGH-HPS total-scores at baseline (p = 0.001) and post-treatment (p = 0.02), and with BDI total-scores at all time-points (p < 0.001). Although ARS total-scores significantly increased, all ARS sub-scores, except guilt sub-scores, did not change over time, indicating absolute stability. Baseline ARS total-, and sub-scores (except tension) were found to predict their ARS follow-up scores (all p < 0.01), confirming relative stability (i.e., the extent to which the inter-individual differences remained the same over time). The relative stability of ARS total-scores and all but two sub-scores (irritability and guilt) were independent from BDI baseline scores.

*Conclusions:* Individuals with TTM reported deficits in affective regulation that demonstrated mostly high relative stability and partly absolute stability. Therefore, targeting to improve affective regulation in individuals with TTM during therapy is warranted.

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### 1. Introduction

Trichotillomania (TTM) is characterized by repetitively pulling out one's own hair from the scalp or other areas of the body with inefficient attempts to decrease or stop hair pulling (American Psychiatric Association, 2013). Pulling is often associated with strong feelings of shame and embarrassment, causing significant distress and/or functional impairment (American Psychiatric Association, 2013). Affective dysregulation is a common characteristic in individuals with TTM (Keuthen et al., 2010) and comprehensive models of development and maintenance of TTM include aspects of affective dysregulation (Flessner et al., 2012; Penzel, 2003; Shusterman et al., 2009). These models have

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proposed that individuals with body-focused repetitive behaviours have difficulty controlling certain emotions and engage in bodyfocused behaviours to avoid, decrease, or attenuate aversive affects (Roberts et al., 2013). Previous studies have reported associations between the severity of hair-pulling, negative affective states (i.e., unattractiveness, depressed mood, shamefulness, and irritability; Stemberger et al., 2000), and difficulty in affect regulation (Keuthen et al., 2011: Shusterman et al., 2009), Furthermore, deficits in affect regulation in individuals with hair-pulling behaviours have been demonstrated to be associated with distinct neuropsychological dysfunctions. For example, abnormalities in the anterior cingulate cortex (Swedo et al., 1991) have been reported to interact with goal-directed behaviours (Devinsky et al., 1995) and repetitive stereotypic movements such as hair-pulling (Chamberlain et al., 2005). Additionally, abnormality in reward processing at the level of the nucleus accumbens has been found to potentially play a role in the pathophysiology of TTM (White et al., 2013). However, while there is reliable and consistent evidence that certain (mostly negative) affective states are associated with hair-pulling behaviours (Christenson et al., 1991; Diefenbach et al., 2002; Duke et al., 2009, 2010), the effect of various affective states in affective regulation (Shusterman et al., 2009) requires further exploration.

The current literature suggests that regulation of distinct emotions (positive and negative) may be impaired in TTM (Shusterman et al., 2009). However, the associations between these distinct emotions and the severity of hair-pulling in addition to the temporal stability of the deficits in affective regulation remain unclear because temporal changes of affective regulation have rarely been investigated (e.g., Keuthen et al., 2010).

To our knowledge, this is the first study to investigate the absolute and relative stability of affective regulation in TTM.

From a clinical perspective, TTM patients appear to have difficulty improving their emotion regulation without first reducing the severity of their hair-pulling behaviours during the course of treatment. Since hair-pulling is a chronic habit, which is unlikely to improve without any proper treatment (Woods et al., 2006), we chose to investigate the relationship between the ability to regulate emotion and hair-pulling severity in the context of one of two Internet interventions, decoupling or progressive muscle relaxation (PMR) (Weidt et al., 2015).

Depressive symptoms are particularly relevant in patients with TTM. Over 80% of hair-pullers report feeling depressed and more specifically, over 30% and 20% of TTM patients report a prior and current history of major depression respectively (Christenson et al., 1991; Stemberger et al., 2000). Additionally, hair-pulling severity has been found to be associated with depressive symptoms (Duke et al., 2009). Therefore, we investigated affective regulation in TTM in relation to hair-pulling severity and depressive symptoms.

While absolute stability refers to the extent that affective regulation scores change over time, relative stability refers to the extent that inter-individual differences remain constant over time (Santor et al., 1997). In order to investigate temporal stability of affective regulation, it is important to examine whether changes in affective regulation are also related to changes in the severity of hair-pulling and other potentially relevant phenotypes (e.g., depressive symptoms). If deficits in affective regulation remain unchanged while hair-pulling severity improves over time, affective regulation may be implicated as a vulnerability factor that may potentially influence relapse of hair-pulling symptoms.

Therefore, our aims were as follows: (1) to assess and compare affective regulation between the present TTM sample and samples from a previous study, which consisted of TTM and non-hair puller samples (Shusterman et al., 2009); and (2) to evaluate the absolute and relative temporal stability of affective regulation over time.

We hypothesized that the deficits in affective regulation of the

present TTM sample are comparable to those from the Shusterman et al. (2009) study and are more severe than the non-hair pullers. Due to the exploratory nature of investigating the temporal stability of affective regulation, we did not provide an *a priori* directional hypothesis for the longitudinal part of this study.

#### 2. Material and methods

Our TTM sample was recruited from an online interventional, double-blind randomized controlled trial (NCT02044237), which has been published previously (Weidt et al., 2015). This study was approved by the local ethics committee of the Canton of Zurich in Switzerland and was conducted in accordance with the declaration of Helsinki. All participants provided their written informed consent prior to participating in any study procedures.

#### 2.1. Subjects

One hundred and five TTM individuals participated in the online survey (UNIPARK, QuestBack) and took part in the randomized clinical trial, which was previously reported elsewhere (Weidt et al., 2015). Diagnostic criteria of TTM and psychiatric comorbidities were assessed during telephone interviews. Inclusion criteria were: (1) DSM-IV-TR diagnosis of TTM (American Psychiatric Association, 2000), (2) age ranging from 18 to 65 years, and (3) sufficient fluency in German language. Exclusion criteria were: (1) current suicidal ideations, (2) dependency of alcohol or drugs, and (3) current psychotic episode. Eighty-one subjects completed the study and were included in the analyses.

For the comparison group, we utilized data from a previously published article by Shusterman et al. (2009), and the sample size was as follows: 1162 TTM and 175 non-hair puller subjects.

#### 2.2. Study procedure

The study protocol was previously described elsewhere (Weidt et al., 2015). In brief, subjects were randomly allocated to one of two online self-help interventions, decoupling (Moritz and Rufer, 2011) or progressive muscle relaxation (PMR, Manzoni et al., 2008). While decoupling aims to "decouple" the different behavioural elements of pulling (Moritz and Rufer, 2011), PMR potentially helps to control certain emotions such as stress, anxiety, and depressive symptoms (Klainin-Yobas et al., 2015). Since these two interventions were chosen and conducted based on different rationales (for more details see Weidt et al., 2015), the relative stability of emotion regulation was also investigated in relation to these interventions (see Statistical Analyses). Both techniques are easy and fast to learn with re-assessments conducted 4 weeks after baseline (post-treatment). To investigate the stability of potential effects on hair-pulling severity and emotion regulation without further treatment, a 6-month follow-up assessment was conducted (Weidt et al., 2015). From the initial 105 recruited participants, 81 (77%) subjects completed the study.

#### 2.3. Measures

The Affective Regulation Scale (ARS) was administered to assess regulation of affective states (Shusterman et al., 2009). The ARS has been designed to include criteria, which are not present in other affective regulation scales and have important relationship with TTM patients. Therefore, Shusterman et al. (2009) compared answers of ARS between individuals with and without TTM. The authors demonstrated that individuals with TTM reported significantly greater problems regulating each emotion than non-pullers. Permission was obtained from A. Shusterman to translate

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