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Emotion profiles in Dialectical Behaviour Therapy: Early Observations Anticipate Treatment Outcome

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Early Observations Anticipate Treatment Outcome

By

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ABSTRACT

Borderline Personality Disorder (BPD) can have various clinical presentations and is also difficult to treat. Researchers have investigated whether subtypes of BPD could explain variability in clinical presentations and outcomes after treatment. Previous research has identified subtypes of BPD based on temperament, which explain some variation in symptoms and outcomes. However, subtypes have typically been created using extensive self-report or structured-interview data. Instead, creating identifiable emotion profiles based on observational data could have a wider range of clinical and research applications, while helping to explain heterogeneity in BPD presentations and outcomes. This thesis is designed to look at emotion profiles in clients with BPD undergoing Dialectical Behaviour Therapy (DBT). Session video recordings were coded and analyzed for 54 clients with BPD, treated in a 12-month randomized controlled trial of DBT at Toronto's Center for Addiction and Mental Health. Thus, a secondary data set was generated based on clients' within-session expression of various emotional states, as defined by the coding of affective meaning states (CAMS). This observational measure has been used to analyze within-session therapy processes and to predict outcome data for a wide range of disorders and therapeutic modalities. Across a range of emotion codes, three unique profiles were found using cluster analysis: a Distressed profile, an Ashamed profile, and an Angry/Flexible profile. Additionally, these early observations of emotion profiles were associated with differential treatment outcomes between groups at 6- and 12-months. Most critically, the group with a primarily Ashamed profile showed a lack of reduction in their rates of self-harm at the end of treatment when compared to the other two groups. The main implication of the present study is that early observations of within-session emotion can be prognostic indicators for assessment and treatment planning in DBT.

DEDICATION

To my family who has always believed in me and supported me in pursuing my passions – this thesis would not be possible without all of you. And to Camran for keeping me grounded even through a global pandemic and a move across the country – you helped keep me in one piece with your love and support!

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CHAPTER I

Introduction

Overview of Current Study

Borderline Personality Disorder (BPD) has been characterized as a disorder with high levels of heterogeneity; variability has been found in client temperament (e.g., Digre et al., 2009), trajectories in therapy (McMain, Fitzpatrick, et al., 2018), and therapeutic outcomes (Zeitler et al., 2020). Thus, researchers have investigated how to better understand treatment-resistant BPD clients and to work towards tailoring treatment to be more effective. The present study will investigate emotion profiles of BPD clients based on the type and duration of emotions expressed in therapy using cluster analyses and will explore the relationship of profile groups to outcomes at the end of therapy (see Table 1). An audiovisual dataset of BPD clients undergoing a randomized controlled trial of dialectical behaviour therapy (DBT) was coded using the Classification of Affective Meaning States (CAMS) to identify the duration and type of emotion states during an early therapy session. Cluster analyses allow for classification of individuals into groups based on similarity on a set of measures, while maximizing differences between groups (Hair et al., 2009). Meaningful differences between the profile groups were validated using baseline and outcome data for rates of self-harm and suicide attempts, impairments in social functioning, difficulties regulating emotion, trait anger, and mindfulness skills. Additional analyses investigated whether the differences in emotion profiles are stable across middle and late therapy sessions. By determining whether emotional presentation is a robust means to study BPD profiles, researchers will gain a better understanding of the variability within BPD and outcomes associated with subtypes. Moreover, by focusing on emotional presentation in therapy, these findings could help clinicians identify BPD subtypes and plan for unique challenges in treatment.

Table 1

Research Questions

1.	Can emotion profiles of clients with BPD who are starting DBT be identified using an observational measure?
2.	Do emotion profiles of BPD clients in DBT remain stable in their characterization?
3.	Are emotion profile groups of BPD clients in DBT related to 6-month and 12-month outcomes?

Dialectical Behavior Therapy for Treatment Resistant BPD

BPD is a precarious disorder involving high risk of self-harm and suicide, and historically has been difficult to treat; indeed, up to 80% will self-harm and 10% die by suicide (American Psychiatric Association, 2013). The key features of BPD are emotion dysregulation, relational dysfunction, and impulsivity, with emotion dysregulation being a more proximal factor in risky behaviours such as self-harm or suicide (Chapman, 2019). DBT is a popular treatment approach that is aimed at mitigating these issues. DBT targets client's emotional and behavioural dysregulation, through weekly individual therapy, weekly group skills training, and brief coaching calls. All aspects of therapy focus on diminishing dangerous behaviour and shifting clients towards adaptive emotional and behavioural regulation (Lynch et al., 2007). First, the therapist focuses on eliminating self-injurious behaviours, therapy-interfering behaviours, and factors that are acutely impacting the client's quality of life (e.g., drug use). Second, the clients participate in weekly group skills training to learn mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness; in turn, they practice integrating these skills to their daily lives through individual therapy. DBT has exhibited efficacy in the treatment of BPD through various randomized controlled trials and has been designed to treat a variety of treatment-resistant populations (for review, see Lynch et al., 2007). Additionally, DBT is

effective at reducing suicide attempts and non-suicidal self-injury episodes (Linehan et al., 2015; Panos et al., 2014; DeCou et al., 2019). However, some indicators, such as drop-out rates (Dixon & Linardon, 2020) and a lack of psychological symptom reduction (e.g., suicidal ideation; DeCou et al., 2019), show that BPD remains partially treatment resistant in DBT.

A meta-analysis of treatment drop-out demonstrated that one in four RCT participants typically dropping out of DBT (Dixon & Linardon, 2020). The dropout rate can be as high as 24-58% for community DBT treatment of BPD, with some studies citing comorbid personality disorders, substance use disorders, younger age, low level of education, higher experiential avoidance, baseline levels of distress, and non-acceptance of emotions as predictors of dropout (for review, see Landes et al., 2016). Thus, understanding factors that influence clients' engagement in DBT is necessary to prevent dropout. Moreover, this pattern of client disengagement with treatment can be indicative of the consequences of stigma towards BPD clients carried out by clinicians who may be overlooking strengths in their clients (Aviram et al., 2006). One way that DBT could be more effective and reduce dropout is to identify differences in emotional processing among those with BPD in order to tailor treatment to mitigate vulnerabilities in emotion dysregulation.

Heterogeneity within BPD

Research has been documenting and attempting to explain the heterogeneity between individuals with BPD and their variable therapy outcomes over the past three decades. In the first place, the DSM-V requires clients to meet at least five out of nine diagnostic criteria for a BPD diagnosis (American Psychiatric Association, 2013). This set of criteria allow up to 256 different combinations of symptoms to receive a BPD diagnosis, which arguably allows too much heterogeneity within the diagnosis (Gunderson, 2010). McMain, Fitzpatrick, and colleagues

(2018) reported three latent subgroups of BPD clients, each with different therapy trajectories and distinctive outcomes. The pattern of each subgroup included 1) quick recovery during treatment and low rates of BPD symptoms at follow up, 2) slow recovery but maintenance of low symptoms at follow-up, and 3) a quick recovery followed by a relapse to baseline rates of BPD symptoms. Additionally, Zeitler et al. (2020) argue that when looking beyond symptomatic remission, subjective well-being and global functioning remain low for a large portion of patients with BPD after treatment. Furthermore, they suggest their findings could be explained by subgroups of BPD, where one subgroup may represent those who report higher life satisfaction despite impairments in global functioning, whereas another subgroup seems to reach acceptable levels of global functioning despite suffering with subsyndromal BPD symptoms and reporting lower quality of life. This study highlights that differential outcomes can occur beyond typically considered BPD symptoms but extend to indicators of overall functioning and represent diverse responses to therapy. Researchers have attempted to resolve findings highlighting the variability in patients and their outcomes by looking at subtypes of BPD, conjecturing that there may be individual differences in vulnerability towards different outcomes.

Subgroups of individuals with BPD have been identified using measures of temperament in an effort to explain the variability in diagnosis and response to treatment. Early on in her research on DBT, Linehan (1993) made clinical observations of two subtypes of BPD, a strongly attached type and a type with poor commitment to therapy. Later research found a bimodal distribution in client response to treatment, which was hypothesized to be associated with the two subtypes (Bohus, 2001, as cited in Digre et al., 2009). Subsequent research investigated subgroups by looking at variability in client temperament, that is, individual differences in response styles (Nigg, 2006). Using attribution theory, one study found groups characterized as

withdrawn-internalizing, anxious-externalizing, and severely disturbed-internalizing (Digre et al., 2009). These groups had differing outcomes after therapy; the withdrawn-internalizing type had reductions in dissociation, the anxious-externalizing type had reductions in depression, and the severely disturbed-internalizing type had no significant improvement on the outcomes included in the study. Another study found clients could be grouped into low anxiety, inhibited, high self-control, and emotional/disinhibited types (Sleuwaegen et al., 2017). These subtypes, based on reactive and regulative temperament, showed different patterns of emotional intensity and expression, along with unique coping strategies. Despite these promising findings, these profiles rely on extensive self-report measures, so identifying clients from different subgroups is likely not a straightforward process for clinicians. Given that temperament is proposed to be a relatively stable individual difference in reactivity, self-regulation, and experience of basic emotions (Bates, 2000), it is possible that identifying profiles of emotional processing will prove a fruitful way to investigate differences within BPD.

The Role of Specific Emotions in BPD

Emotional difficulties are characteristic of BPD, so considering the role of specific emotions in treatment outcomes may be a means to understand the diversity across individuals with BPD. Research investigating emotions in BPD has generally focused on impairments to emotional regulation (e.g.: Chapman, 2019; Conklin et al., 2006). Emotion regulation encompasses one's efforts to change the form, frequency, experience, or expression of emotions to create a self-regulated response, thereby behaving in pursuit of one's goals (Gross, 2014). Indeed, a focus of DBT is to address client's underlying emotional vulnerabilities through emotion regulation strategies (Lynch et al., 2007). Despite past research highlighting underlying emotional vulnerabilities in BPD, there is relatively little research outlining the kinds of

emotional experiences that individuals with BPD struggle with. Conklin and colleagues (2006) argue that BPD patients struggle with both emotion dysregulation and negative affect, identifying these as distinct constructs that can help to differentiate subtypes of BPD. Research is needed to further understand the kinds of emotional experiences of individuals with BPD have and to explore whether their distinct emotions relate to heterogeneity.

Several emotions have been suspected of playing a role in BPD symptomology. Studies have found that shame may play a moderating role in the reduction of symptoms in therapy. One study showed that shame predicted lower reductions in suicide and non-suicidal self-injury ideation (Rizvi & Fitzpatrick, 2021). Another study showed that self-reported shame and associated behaviours predict greater likelihood of self-harm episodes (Brown et al., 2009). Thus, it appears that shame may play a significant role in risk of self-harm or suicide symptoms. Furthermore, anger rumination has been shown to be a potential risk factor for BPD symptom severity (Sauer-Zavala et al., 2013). Martino and colleagues (2018) demonstrated that anger mediated the association between emotion dysregulation and aggression, whereas depressive ruminations mediated the association between emotion dysregulation and self-harm.

In an experimental study, Schoenleber and colleagues (2016) found significant variability in the experience of anger, anxiety, and shame/guilt in women with BPD during an emotionally distressing task. Shifts in the frequency and intensity of these emotions were associated with different levels of BPD symptoms, suggesting substantial heterogeneity in the emotional experience of women with BPD. Therefore, it is possible that individuals who fall under the BPD diagnosis have a propensity for distinctive emotional experiences, which may represent different degrees of vulnerability or resilience. There is a need for researchers to further understand the role emotions play in explaining the variability across individuals with BPD, as it may be crucial

in explicating diverse therapy outcomes. Finally, there would be significant clinical utility in findings that might instruct therapists on how to identify profiles of client emotional expressive styles in treatment, without having to draw such information from lengthy self-report questionnaires on temperament or personality, which has commonly been the method of prior studies.

The Sequential Model of Emotion Processing

The sequential model of emotional processing can offer potential insights into the kinds of emotions that may distinguish emotion profiles of individuals with BPD. This model was formulated to identify relevant emotions in therapy and to explain how emotions change in productive ways during therapy. According to Greenberg and Pascual-Leone (2006), emotional processing comprises of emotional awareness, the activation and expression of emotion (i.e., the upregulation of adaptive emotion), emotion regulation (i.e., down-regulation of distressed states), reflection on emotion (i.e., meaning-making based on emotion), and emotion transformation (i.e., changing emotion with emotion). The sequential model focuses primarily on emotional transformation, mapping out how emotions change in a sequential order (Pascual-Leone, 2018), but this process relies on all other components of emotional processing (e.g., awareness, activation, reflection on meaning). The model was constructed based on the premise that some types of emotions are productive for therapeutic change, whereas other types can keep clients stuck in distress (Kennedy-Moore & Watson, 2001). This means that certain kinds of anger or sadness, for example, diverge in how beneficial they are for positive personal change.

Using task analysis Pascual-Leone and Greenberg (2007) were able to capture qualitatively different emotion states and map out productive transitions between them. The model produced a multi-step sequence describing how clients work through their distress in

therapy (for review see Pascual-Leone, 2018). Clients often enter therapy with "early expressions of distress," that is, communicating painful emotions that they have difficulty overcoming. The model moves through early expressions of distress towards more specific advanced meaning-making states, namely primary adaptive emotions (see Table 2). Early expressions of distress encompass either primary maladaptive emotions or secondary emotions. Primary maladaptive emotions are learned emotional responses that are inflexible or no longer applicable to the current circumstances (Greenberg & Pascual-Leone, 2006) and imply negative evaluations of the self (Pascual-Leone, 2018). Secondary emotions are produced in reaction to an underlying emotion, such as anger or distress when experiencing painful emotions. Conversely, primary adaptive emotions (also called "advanced emotional processes") are healthy responses to current situations that allow individuals to ascribe a clear meaning to their emotional experience by identifying unmet needs, affirming positive self-evaluations, and mobilizing clients towards adaptive action tendencies (Pascual-Leone & Greenberg, 2007).

The first step in the model shows that people often begin therapy in a secondary emotion called Global Distress; this state is characterized by high amounts of distress and low levels of meaning, with clients often struggling to communicate the source of their distress or the steps they can take to resolve their difficulties (Pascual-Leone, 2018). Next, maladaptive Shame/Fear is a core maladaptive emotion state. It represents a client's expression of withdrawal in the face of negative self-referential emotions such as shame and terror. Shame/Fear often emerges as a source of enduring pain in the client's life. The last early expression of distress is Rejecting Anger, a secondary emotion that is characterized by anger towards a specific person or an experience and tends to reflect a blaming or destructive judgements. This emotion state allows

individuals to become aware of what they do not want, but it does not facilitate a clear sense of what they want.

In contrast, the sequential model of emotional processing explains adaptive emotions as expressing underlying existential needs, clear self-affirmation, and mobilizes actions to address unmet needs. Assertive Anger occurs when the client's anger is directed at advocating for a personal need; thus, giving individuals a clear sense of what they are pursuing. Assertive Anger is present when individuals are advocating for themselves and setting boundaries (Pascual-Leone & Greenberg, 2005). Self-Compassion is also oriented towards a personal need, but clients move to fulfill that need through self-soothing. Self-Compassion often looks like positive self-talk (e.g., "I will make it through this difficult time"), imagining compassion towards the self, and recognizing their current resources. Hurt/grief represent an acknowledgement of sadness over some loss or a deep wound which implies an unmet need. Additionally, although they are not emotion states per se, the identification of negative evaluations and existential needs are also included in this model because they are conceptualized as key ingredients for transforming early expressions of distress towards adaptive emotions. However, these codes will not be used in the study as they are not always explicitly stated by participants.

Table 2

Sequential Model of Emotional Processing Components

Early Expressions of Distress	Global Distress
	Fear/Shame
	Rejecting Anger
Adaptive Emotions	Assertive Anger
	Self-Compassion
	Hurt/Grief

There is substantive evidence from therapy-process research that processing emotions leads to improved treatment outcomes across therapies (Greenberg & Pascual-Leone, 2006). The sequential model of emotional processing has predicted relevant therapy processes and outcomes across humanistic-experiential, psychodynamic, and behavioural treatments (Pascual-Leone, 2018). This research has been conducted across many disorders, spanning depression, anxiety, adjustment, trauma, and personality disorders. This body of research highlights the benefits of working through model components and achieving adaptive emotions through findings looking at positive outcomes after therapy. For example, research looking at successful treatment outcomes found greater frequency in adaptive emotions such as grief (Pascual-Leone & Greenberg, 2007), self-compassion (Kramer, Pascual-Leone, Rohde, et al., 2016), and assertive anger (Kramer, Pascual-Leone, Berthoud, et al., 2016). One study found that experiencing at least 1 minute of an adaptive emotion (i.e., grief) could discriminate between successful and unsuccessful therapy outcomes (Pascual-Leone & Greenberg, 2007). Research has also found that early expressions of distress are important stepping-stones towards adaptive emotions, with

clients often moving “two steps forward, one step back” as they increase in their capacity for adaptive emotions (Pascual-Leone, 2009). However, previous research has not closely investigated whether the emotional states may be expressed to varying degrees early in therapy and how clients that start out with different capacities for emotional expression may have idiosyncratic trajectories and outcomes in a treatment.

Emotional Processing in BPD

By capturing both maladaptive and adaptive emotional states, Pascual-Leone and Greenberg’s (2007) sequential model of emotional processing could help to clarify the theoretically diverse emotional experiences of clients with BPD during DBT. Indeed, some research shows validity for this model in studying BPD. For instance, clients with BPD tend to have high levels of undifferentiated emotion (Holm & Severinsson, 2008), known in this model as Global Distress. Transformations from Global Distress to more differentiated emotions (such as Shame/Fear or Rejecting Anger) are associated with markers of emotional processing during therapy for BPD (Williman et al., 2016). Furthermore, Kramer, Pascual-Leone, Berthoud, and colleagues (2016) showed that increases in assertive anger mediate improvements in social functioning found in a DBT skills-training treatment for BPD clients. Additionally, a study looking at change processes in therapy for patients with personality disorders demonstrated that good outcome cases showed more self-compassion and rejecting anger than poor outcome cases (Kramer, Pascual-Leone, Rhode, et al., 2016). Thus, it seems that emotions identified in the sequential model are predictive of fruitful therapy processes and positive outcomes for individuals with BPD. Furthermore, van der Kaap-Deeder et al. (2021) found that unfulfilled psychological needs (i.e., need frustration) are a mediator between emotional dysregulation and BPD features. This provides further evidence that the sequential model is relevant to studying

BPD because the sequential model of emotional processing also suggests that unmet needs are an underlying mechanism in maladaptive emotional responses.

Rationale for Study

Identifying emotion profiles of BPD could help to clarify findings about the heterogeneity of clients with BPD and their diverse treatment outcomes. Subgroups of BPD could explain variability in outcomes in social functioning and symptomatology, for clients going through DBT (Zeitler et al., 2020). This study will investigate how subgroups of BPD clients, based on their emotional presentation, may differ across a variety of variables, including measures covering BPD symptoms, including specific measures of suicide/self-injury behaviours, emotional dysregulation, anger, social adjustment, and mindfulness skills.

Research on BPD has not typically looked at emotional processing variables as a means of explaining heterogeneity. Instead, research has tended to focus on symptoms and temperament (e.g., Sleuwaegen et al., 2017). Additionally, many previous categorizations of subgroups are not typically anchored in directly observable behaviors, instead using self-report measures. Although emotional subtypes could be created using client symptoms, self-report measures, therapist ratings, or clinical theory, I will use a measure of observable emotion to investigate the kinds of emotional experiences clients have during DBT sessions. No study has looked at in-vivo emotional processing underpinning subgroups of BPD. Profile groups created through measures of observed emotion would allow researchers to categorize the emotional presentation of clients during a given therapy session. Indeed, the sequential model of emotion change was developed using observable expressed emotion during therapy to better understand client emotional processing (Pascual-Leone & Greenberg, 2007). Furthermore, although some research has identified subgroups of BPD (Digre et al., 2009; Sleuwaegen et al., 2017; Conklin et al., 2006),

none have used observable emotion to do so. Unlike personality or temperament which may point to individual differences between clients, observations of emotional presentation in this context are understood to represent a combination of both a client's individual differences in their emotional-expressive style and the dynamic interaction of emotional expression with the context of therapist interventions and therapy approach. Thus, subgroups in this context will be conceptualized as emotion profiles that emerge within the context of therapy. Using features of observable emotional presentation within a typical therapy session would also provide strong clinical utility for therapists to understand the client they are working with.

The current study will use independent raters to code an early video-taped therapy session for a variety of emotional states during each minute of a session. Early sessions were chosen because the overarching research question is to look at whether these emotion profiles can be identified early in therapy. Every minute that a client expresses emotion during one early therapy session could potentially be coded as a distinct emotion. The total time spent in each emotion state, in proportion to the time spent expressing any emotion state, will be used in a cluster analysis to classify clients based on their similarity across emotion states and thus create cohesive emotion profile groups that are dissimilar from one another. The emotional states will be determined by the Classification of Affective Meaning States (CAMS), a measure based on the sequential model of emotional processing (Pascual-Leone & Greenberg, 2005). Methodology using this coding system for emotional states has been highly rated in a study evaluating the quality of process research in BPD therapies (Rudge et al., 2020). It should be noted that the present study does not make predictions about the sequence that emotions appear, but rather the focus of the cluster analysis is on the *type* of emotion clients express and the *duration* of each type of expressed emotion.

Nevertheless, few studies have looked at DBT therapy processes using the CAMS (see table 2 in Pascual-Leone, 2018). Studying observable emotions of BPD in DBT will not only help researchers clarify the heterogeneity within the disorder, but it could lead researchers and clinicians to focus beyond the emotional regulation difficulties BPD clients experience to instead examine the actual emotional states these clients struggle with. Should instances of productive emotion be observed in profile groups early in therapy, this approach could also point to an underlying emotional resilience that clients may have when working through dysregulated or maladaptive emotional states.

An additional benefit of this study is that using observable emotions to find emotion profile groups of BPD clients in this study will be useful for clinicians to identify subgroups of BPD, as it is feasible to code these emotion states in real time. Moreover, if clinicians can identify emotion profiles of clients early in therapy, this might aid in assessment and treatment planning. The coding system used in this study uses minute-by-minute codes of expressed emotion, which may make it possible for therapists trained in this system to identify emotion profiles. By identifying emotions profiles of BPD clients, clinicians might better understand the kinds of clients they are working with during assessments, particularly the kinds of emotional expressions they tend to have and any associated symptomology at baseline. Additionally, this study aims to investigate each emotion profile group's potential treatment outcomes which could help clinicians during treatment planning. Having information about the trajectories of client emotion profile groups in therapy and their outcomes could also help clinicians tailor treatments to clients and anticipate their potential areas of strengths or weaknesses, and perhaps even to identify markers for intervention. Indeed, Conklin and colleagues (2006) propose that subgroups of BPD may require different intervention strategies, given their findings showing distinct

patterns of affect regulation in subtypes of BPD. Additionally, emotion profiles may provide clinicians with a nuanced understanding of the differences in emotional processing within the heterogenous BPD category and potentially combat stereotypes and stigma about the difficulties of treating BPD. Overall, identifying emotion profiles could help clinicians be better prepared to understand and treat BPD clients with different types of emotional presentation.

To assess emotion profile groups of BPD clients, I will use a cluster analysis to group clients with similar amounts of specific types of expressed emotions into profiles of emotional presentation. Although previous research has investigated subtype profiles of BPD using cluster analysis (Digre et al., 2009; Sleuwaegen et al., 2017), the present study will use observational data of emotional expression during therapy. Thus, the study will expand beyond the current research on subtypes of BPD, which has typically focused on clinician ratings or self-report data on temperament. Moreover, the fact that cluster analyses have found subtypes based on profiles of client temperament to be associated with distinct outcomes could be indicative that observable emotions as the basis of clusters may be a fruitful next step in understanding subtypes of BPD. The present study will further investigate whether emotion profiles found using cluster analysis is a viable way to understand BPD clients in therapy and their associated outcomes.

Hypotheses

The present study will investigate whether homogenous subgroups can be identified based on BPD clients' emotional presentation in early DBT sessions. Three hypotheses, all of which are exploratory, will investigate emotion profile groups using a measure of within-session emotions (see Table 3). The proportion of time clients spend in any given emotional state, relative to the total expressed emotion in that session, will serve as the emotional process variables to classify clients in the cluster analysis. Thus, each the proportion of time in each type

of emotion will be included in the cluster analysis, including Global Distress, Fear/Shame, Rejecting Anger, Assertive Anger, Self-Compassion, and Hurt/Grief. The cluster analysis will identify similarities in proportions of each emotion and create groups based on observed similarities that are discrete from one another (i.e., emotion profile groups). Indeed, cluster analysis is an exploratory method for creating relatively homogenous subgroups to clarify differences within a larger heterogenous group of participants based on a set of measures (Bardhoshi et al. 2020). The emotion profile groups will then be tested in a series of analysis of variance to examine differences between subtypes across diverse outcomes measured at six months of therapy and at the end of one year of therapy.

Table 3

Hypotheses

1.	Emotion profiles of BPD clients starting DBT can be identified based on an observational measure of emotion in an early therapy session.
2.	Emotion profiles are stable across time between and within groups across early, middle, and late therapy sessions.
3.	Emotion profile groups of BPD clients will be associated with 6-month and/or 12-month treatment outcomes.

Hypothesis 1: BPD Emotion Profiles Can Be Identified based on Observed Emotion

Given that cluster analysis is an exploratory technique, I have no specific predictions about what the emotion profiles of BPD subgroups will look like and how they will be related to the outcomes. However, I do expect that identifiable emotion profiles will emerge during an early therapy session (chosen between sessions 4-6) by clustering clients based on the amount of time they spend in each type of emotion state. This hypothesis assumes that participants will present significantly different emotion profiles when looking at emotion categories across groups, but members from each group will have similar levels of emotion. Furthermore, this hypothesis will also investigate the validity of these emotion profiles by examining significant

differences between the groups across each emotion and across additional baselines measures using analysis of variance and/or non-parametric tests.

Hypothesis 1(a): Cluster Analyses Will Identify Emotion Profiles. For the first part of this hypothesis (1a), I anticipate that cluster analysis will allow for grouping participants together based on similarity on their levels of each early expression of distress (i.e., global distress, fear/shame, and rejecting anger) and their levels of adaptive emotions (i.e., assertive anger, self-compassion, and hurt/grief). Additionally, I expect that the cluster analysis will allow me to find an intuitive number of groups that maximizes differences between the groups and minimizes differences within the groups using a range of emotion measures.

Hypothesis 1(b): Identifying Features of BPD Emotion Profiles. The second step in this hypothesis (1b) will be to identify features of the clusters by examining differences between the groups based on each relevant emotion category. I will analyse differences between the groups on each emotion variable to validate that each group has distinct emotional characteristics. Additionally, I will describe each group's emotional features, by looking at the average proportion of each emotion type, thus identifying each group's unique emotion profile.

Hypothesis 1(c): Differences in Baseline Symptoms Between Profiles. Finally, the third step in this hypothesis (1c) will be to analyze whether the emotion profile groups are distinct across a range of baseline symptoms. This step will allow me to validate that the emotion profile groups are relevant to other BPD symptomology, thus providing convergent validity for the findings. The baseline symptoms will include measures of BPD symptomology, psychological symptoms, interpersonal difficulties, emotion dysregulation, trait anger, and mindfulness skills.

Hypothesis 2: Emotion Profiles Are Stable Across Time Between and Within Groups

The second hypothesis is that the groups identified in early sessions will maintain similar levels of emotions across later time points, suggesting stability of emotion profiles over time. After emotion profile groups are created based on an early session emotional presentation, these groups will be compared against one another during the middle and late session time points, thereby showing whether differences between the groups for each type of emotion are similar to differences in the early timepoint and are stable over time. In this way, clusters created during the early phase of treatment, will be re-examined comparing observable levels of emotion during the working phase of treatment, and again in the late phase of treatment. Additionally, levels of each emotion across the first, second, and third sessions will be compared in a longitudinal analysis within each emotion profile group, and thus, showing whether levels of each emotion change over time for each profile. This hypothesis will act as test-retest reliability to find out if patterns of emotion remain stable over time spent in ongoing therapy. Moreover, this hypothesis will reveal the degree to which client deviate from their original emotion profile as initially observed in the early phase of treatment.

Hypothesis 3: Emotion Profile Groups Relate to Treatment Outcomes at 6- and 12-Months

The third hypothesis is that emotion profiles will be associated to distinct outcomes at 6 months of treatment and at the end of 12 months of therapy spanning the areas of BPD symptoms, psychological functioning, social functioning, emotion dysregulation, trait anger and mindfulness skills. I expect that the profile groups will have different 6- and 12-month outcomes depending on their emotion profiles early in therapy. This hypothesis will help to clarify whether emotional profile subgroups can explain diverse outcomes for clients with BPD when therapy is completed.

CHAPTER II

Method

Participants

Participants come from an archival dataset that evaluated the effectiveness of 12-months versus 6-months of DBT for BPD (McMain, Chapman, et al., 2018). The randomized clinical trial was single-blind and was conducted at the Centre for Addiction and Mental Health (CAMH) in Toronto, Ontario, as well as at Simon Fraser University in Burnaby, British Columbia. The trial was reviewed and approved by the ethics boards at each of the sites, and participants gave written informed consent before randomization. Participants were randomly assigned to 6-month or 12-month treatment. Although treatment allocation was known to therapists and participants, it was unknown to researchers collecting the data, except for those administering the Treatment History Interview-2. Due to constraints related to data sharing between institutions as well as feasibility, the present study will only examine the data from the 12-month DBT trial at the CAMH site. All participants gave consent to have their sessions video recorded.

The present study's sample consists of 54 clients who were eligible to participate. Participants were recruited from waitlists at the sites, advertisements, and referrals between January 2015 until June 2017. Eligibility requirements included a diagnosis of BPD through the Diagnostic and Statistical Manual Version IV (DSM-IV), being 18 to 60 years old, and having at least two episodes of suicide attempts or non-suicidal self-injury in the past 5 years, English proficiency, and valid health insurance in the province of Ontario or British Columbia (this latter criterion was related to the collection of provincial health care data in the original project). Participants were excluded if they had a diagnosis of Bipolar I disorder, dementia, or a psychotic disorder, a serious physical ailment requiring hospitalization over the course of the year, an IQ of 70 or less, at least 8 weeks of DBT in the past year, or if they had plans to move out of the

province during the study trial. Due to restrictions on available data, the current study will only make use of cases collected by CAMH in Ontario. Although the original sample has 120 participants, the parameters of our data sharing agreement allowed access to video data for 54 cases, which will be the main sample used in this study.

Across the sample, 74.1% of participants identified as female, 18.5% identified as male, and 7.4% identified as another gender (specific information was unavailable). Their ages ranged from 18 to 45 years (M = 27.9, SD = 7.4). Over 74% of the participants were never married, 18.5% were married/common-law, 3.7% were separated, and 3.7% were divorced. In terms of education, 3.7% did not complete high school, 11.1% obtained a high school diploma, 35.2% had some post-secondary, 25.9% had a college diploma or trade certification, 18.5% obtained a university degree, and 5.6% completed a master's or doctoral degree. Regarding annual income, 63.5% of participants made under $15,000 USD, 17.3% made between $15,000 to $30,000 USD, 11.5 % made between $30,000 to $50,000 USD, 7.7% made over $50,000 USD, and 3.7% did not respond. Data regarding participants' lifetime and current comorbid disorders were collected. In terms of lifetime prevalence, 79.6% had received a major depressive disorder diagnosis, 7.4% had received a bipolar disorder diagnosis, 81.5% had received an anxiety disorder diagnosis, 27.8% had received a panic disorder diagnosis, 53.7% had received a post-traumatic stress disorder (PTSD) diagnosis, 9.3% had received an obsessive-compulsive disorder (OCD) diagnosis, 50% had received an eating disorder diagnosis, and 92.6% had received a substance use disorder diagnosis. The mean number of lifetime comorbid diagnoses were 5.26 (SD = 2.13). Regarding current comorbid diagnoses, 35.2% had a major depressive disorder diagnosis, 7.4% had a bipolar diagnosis, 75.9% had an anxiety disorder diagnosis, 22.2% had a panic disorder diagnosis, 27.8% had a PTSD diagnosis, 3.7% had an OCD diagnosis, 33.3% had a generalized

anxiety disorder diagnosis, 16.7% had an eating disorder diagnosis, and 48.1% had a substance use disorder diagnosis. The mean number of current comorbid diagnoses were 2.55 (SD = 1.54).

Procedure

The present study using archival data was approved by the ethics board at the University of Windsor. Data collection, including all therapy sessions, occurred from 2016 to 2018. Participants completed questionnaires, including the outcomes measures in this study, every three months from baseline and up to 24 months later. Thus, participants received questionnaires throughout their one year of therapy and during an additional one year of follow up. Data at the 6-month and 12-month time points were used for the outcome measures.

With regards to the present study, participants' early, middle, and late session video data was coded using the Classification of Affective Meaning States (CAMS; Pascual-Leone & Greenberg, 2005), an observational measure of emotional states that captures maladaptive and adaptive responses. First, participants who had at least three suitable sessions for each time point were selected for the present study. Then, three sessions for each time point (i.e., early, middle, late) were observed and one session was selected for coding using the CAMS. Lastly, the selected session for each time point was coded for observed emotions.

Session Selection Criteria

For the early, middle, and late session timepoints, one session was chosen (out of three sessions) for emotion coding based on selection criteria that maximizes the suitability of the coding measure. Sessions were primarily selected by a separate research team from the one that coded sessions, led by a researcher trained on the CAMS. One session was selected from three possible sessions for each participant across three timepoints: for the early session timepoint one session was selected from sessions 4, 5, or 6; for the middle session timepoint, one session was

selected from sessions 11, 12, or 13); and for the late session timepoint one session was selected from sessions 25, 26, or 27). The criteria for session selection were that the session explores a negative relational event and the client's emotional arousal while discussing the event lasted for at least 5 minutes. In cases where multiple sessions meet these criteria, raters selected the session with the longest codable sections with greater range of emotion codes expressed to maximize the use of the observational measurement tool.

Observational Coding

Once selected, sessions were coded minute-by-minute, producing a time-based sequence of emotions. Total time spent in each emotion was tabulated and the raw sums of time spent in each emotion was divided by the total in-session time spent across all emotions to create a proportion of time spent in a given emotion. These proportional data for the early session were used in a cluster analysis to determine homogenous emotion profile groups (Hypothesis 1). Then, the groups were contrasted using univariate analyses of variance and non-parametric analyses to examine differences across each emotion state between groups, for middle and late sessions, as well as differences in emotion states within groups across early, middle, and late sessions (Hypothesis 2). Finally, groups were compared across five potential outcome measures using analysis of variance (Hypothesis 3).

Intervention

DBT is an empirically supported treatment for BPD that has shown efficacy (Binks et al., 2006; Linehan et al., 2015; Panos et al., 2014; DeCou et al., 2019). It was developed for use on BPD populations that experience high amounts of parasuicidal behaviour (Linehan, 1993). The present study followed standard DBT protocols: weekly one-hour long individual therapy sessions, weekly group skills training (2-2.5 hours), as-needed phone consultations to coach

clients in the use of skills, and weekly therapist consultation team meetings to support and enhance therapist skills and motivation (McMain, Chapman, et al., 2018). While the current study will not examine intervention effects, the treatment is relevant because that is the context in which clients will express observed emotions (i.e., affective-meaning states), which in turn are the basis for emotion profiles.

Outcome Measures

Suicide Attempt Self-Injury Interview (SASII)

The SASII is a semi-structured interview measuring the frequency and severity of self-injury and suicide attempts through gathering details on the method, lethality, and impulsivity of the relevant behaviours, as well as the likelihood of rescue and suicide intent (Linehan et al., 2006). These variables are assessed by first screening for self-injury episodes (individual acts or clusters of acts) and then by examining each episode separately. The SASII has been found to have adequate validity and good interrater reliability (Linehan et al., 2006). The self-harm and suicide attempt data from the SASII was transformed from a frequency to a binary variable looking at presence or absence of at least one self-harm or suicide attempt episode.

Borderline Symptom List-23 (BSL-23)

The BSL-23 is a 35-item self-report measure that assesses specific BPD symptoms (Bohus et al., 2009). It asks participants to rate their symptoms during the past week using a Likert-scale for items from 0 (“not at all”) to 4 (“very strong”). Higher total scores indicate greater amounts of borderline symptoms. The BSL-23 has been found to reliably discriminate between BPD and other diagnoses (Bohus et al., 2009). It also demonstrated sensitivity to changes in BPD symptomatology. The current sample demonstrated strong internal consistency reliability ($\alpha = .94$) for baseline BSL-23 scores.

Symptom Checklist-90 Revised (SCL-90-R)

The SCL-90-R is 90-item self-report questionnaire designed to measure psychological symptoms over the past week (Derogatis, 1994). The subscales include measures of somatization, obsessions/compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Previous studies have shown the subscales have good internal reliability (α = .79 to .90; Derogatis & Savitz, 1999). The current sample had good to very good internal consistency reliabilities (α = .76 to .89) across baseline subscales.

Inventory of Interpersonal Problems (IIP-64)

The IIP-64 is a 64-item self-report measure that assesses patterns of interpersonal difficulties (Horowitz et al., 2000). These difficulties are grouped into eight subscales measuring a range of interpersonal styles, including: domineering/controlling, vindictive/self-centered, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing, and intrusive/needy. Higher scores signify greater difficulties in a given interpersonal style. Additionally, a total score determines the overall level of severity in the individual's interpersonal difficulties. The IIP-64 was found to have good internal consistency across its subscales in a clinical sample (α = .76 to .96; Horowitz et al., 2000). In the current study, the baseline IIP-64 scale demonstrated excellent internal consistency reliability (α = .92), and subscales ranged from good to very good internal consistency reliability (i.e., α = .71 to .84).

Social Adjustment Scale Self-Report (SAS-SR)

The SAS-SR is well-established measure of social functioning and uses 54 items to explore six social areas: work role, social and leisure, extended family, primary relationship, parental, and family unit (Rzepa & Weissman, 2014). However, many of the scales had a low

response rate in this sample, thus this scale was not used in its entirety. Instead, a binary variable rating of whether or not a participant is employed was used in the analyses.

State and Trait Anger Expression Inventory-2 (STAXI-2)

A 44-item self-report questionnaire that measures subjects' experiences and expressions of anger rated on a Likert-scale. Importantly, the STAXI-2 differentiates between different ways anger is expressed, such as by reacting angrily towards others or by suppressing and withholding their anger. The subscales of this measure were shown to have adequate internal consistency for healthy and psychiatric samples (all α's > .70; Lievaart et al., 2016). Moreover, the measures of anger control and expression are positively associated with personality characteristics, such as agreeableness and conscientiousness, and neuroticism respectively (Lievaart et al. 2016). The STAXI-2 could provide insight into participants' experiences of anger, above and beyond their general emotion regulation difficulties (Martino et al., 2015). Given the relationship between anger and poor social functioning in those with BPD (Ellison et al., 2016), this measure has important clinical implications. The current study showed very good internal consistency (α = .86) at baseline for the Trait Anger Scale.

Difficulties in Emotional Regulation Scale (DERS)

The DERS measures difficulties in emotional regulation across 36 self-report items (Gratz & Roemer, 2004). Items are measured on a 5-point Likert scale from 1 (almost never) to 5 (almost always). There are six dimensions in this measure: a) lack of emotional awareness, b) lack of emotional clarity, c) nonacceptance of emotional responses, d) limited access to emotion regulation strategies, e) difficulties controlling impulses while experiencing negative emotions, and (f) difficulties engaging in goal-directed behaviours. This measure was shown to have high internal consistency overall (α = .93), as well as for each subscale (α > .80; Gratz & Roemer,

2004). Some of the subscales have discriminated between self-harm outcomes for men and women (non-acceptance for men; clarity and awareness for women), thus representing clinical utility (Gratz & Roemer, 2004). In addition, subscales representing difficulties in behavior control have been associated with clinically relevant outcomes, such as partner abuse. The present study demonstrated very good internal consistency for total scores at baseline (α = .87). Subscales ranged from good to excellent (α's = .74 to .89).

Kentucky Inventory of Mindfulness Skills (KIMS)

The KIMS was developed to assess the levels of mindfulness skills across 39 self-report items (Baer et al., 2004). This measure uses a 5-point Likert scale from 1 (never or rarely true) to 5 (almost always true). The four subscales include client's ability to observe (α = .91), describe (α = .84), act with awareness (α = .83), and accept without judgement (α = .87). The KIMS measure has been shown to be reliable in samples of healthy and BPD samples (Baer et al., 2004). In the current study, the internal consistency for total scores at baseline was good (α = .80). The subscales ranged from good to excellent (α = .75 to .88).

Process Measure & Cluster Analysis

Classification of Affective-Meaning States (CAMS)

The CAMS is an observational measure of emotional states as they occur in the moment (Pascual-Leone & Greenberg, 2005). It requires a trained rater to review audio or audiovisual data. There are 11 potential codes judged minute-by-minute with the following possible options: global distress, fear/shame, rejecting anger, self-compassion, assertive anger, hurt/grief, relief, acceptance/agency, and mixed/uncodable. Two more codes for negative evaluation and existential need are recorded separately, as they often co-occur with other emotion codes. Two independent raters underwent training on the use of the CAMS under the supervision of one of

the original authors. Reliability between raters was measured on 40% of the sample across all three time points. Substantial reliability was evaluated at Cohen's kappa of > .61 (Landis & Koch, 1977). The overall reliability across all codes was k =.76 (see Table 4 for a summary of reliability). Further investigation of the reliability of each emotion code is reported in table 4. Two codes were below the substantial kappa level (i.e., Rejecting Anger, Self-Compassion, Hurt/Grief), but given the low base rate, any discrepancy affected the kappa considerably. These codes were still used in the analyses given that they are considered to have moderate reliability (Landis & Koch, 1997). When considering adaptive emotions together (i.e., Assertive Anger, Self-Compassion, and Hurt/Grief), the reliability was substantial. Thus, a code of overall Adaptive Emotion will be considered in some analyses; this variable was created by adding the proportions of Assertive Anger, Self-Compassion, and Hurt/Grief. Disagreements in the codes were discussed by both raters and the resolved codes were included in the final data set subjected to analyses. This means the reported reliability is an underestimate for the data that was used.

Table 4

Reliability of Emotion Codes

Emotion Code	Cohen's Kappa	Base Rate
All Codes	.76*	
Global Distress	.78*	59%
Fear/Shame	.82*	27%
Rejecting Anger	.54	4%
Assertive Anger	.81*	4%
Self-Compassion	.62*	1%
Hurt/Grief	.52	3%
Relief	.92*	2%
Adaptive Emotion	.67*	8%

*Codes for which the agreement is substantial or almost perfect.

Analytic Plan

Hypothesis 1: BPD Emotion Profiles Can Be Identified based on Observed Emotion

Hypothesis 1(a): Cluster Analyses Will Identify Emotion Profiles

Participants were grouped using *cluster analysis* based on the proportions across a range of their emotion codes during their early session. Cluster analysis groups individuals into the same cluster when their scores are more similar to one another compared to the scores of other individuals based on a set of variables (Hair et al., 2009). Thus, cluster analytic techniques use distance measures (e.g., Euclidean Squared Distance) to join the closest cases in a matrix (i.e., across a range of variables) into clusters. Then, in successive steps, it joins cases and clusters when their proximities in the updated matrix are close together. The benefit of this type of

analysis is that it can group people together using scores from multiple variables simultaneously to create homogenous groups with distinct profiles on those variables. A combination of two types of cluster analyses are recommended to maximize the advantages of each approach and compensate for each of their weaknesses (Everitt et al., 2001; Hair et al., 2009; Henry et al., 2005): (1) hierarchical cluster analysis can be used to establish the number of potential underlying subgroups based on a set of variables; (2) iterative cluster methods, such as k-means, are recommended to classify cases into a predetermined number of groups to increase the similarity within groups and the separation between the groups. In the present study, Euclidean squared distance was used to assess proximity in both cluster analyses.

Hierarchical cluster analysis produces sets of nested clusters through a sequential pairing of variables and clusters, then checking for the highest average intercorrelations (Bridges, 1966). Clusters become larger and more inclusive at each successive step, where similar clusters are joined together until all clusters are joined into one large group. The benefit of this type of clustering method is that it produces a tree-like structure (i.e., a dendrogram; See Appendix A) that visually represents the clustering process such that researchers can see each step at which a cluster was formed and subsequently joined to another cluster (Hair et al., 2009). Then, a visual inspection can depict the relative distances at which each cluster was combined. Larger distances mean that the fused groups are more dissimilar to one another than at smaller distances. Examining the dendrogram will be the first step for determining the number of clusters that will be selected. The disadvantage to hierarchical cluster analysis is that when subjects or clusters are joined, they cannot subsequently move to other clusters, so early combinations can undermine the similarity (i.e., cohesion) within clusters given that subjects cannot change cluster membership as the clusters' properties change in subsequent combinations (Hair et al., 2009).

Additionally, hierarchical analysis on its own is only appropriate when the data is theoretically nested in its underlying structure (Henry et al., 2005), which is not the case for the present data.

Non-hierarchical approaches use a predetermined number of clusters and can iteratively classify sets of objects; the K-means approach randomly selects a set of objects based on the predetermined number of clusters and classifies all objects into the initial clusters using minimum proximity on a set of variables. Then, it calculates the centroid of each cluster and reclassifies the objects while considering the previous centroids (Bardhoshi et al., 2020). K-means cluster analysis then iterates the last two steps until a stable solution is found and no objects change their cluster membership. Thus, I used the k-means approach to look for a solution that used the number of clusters suggested by the hierarchical cluster analysis. Moreover, I examined markers that the solution is stable, by looking at the number of iterations and the distance scores at which clusters were created. As well, I looked for convergence between the k-means and the hierarchical analysis, such that both analyses produced theoretically similar groupings. This allowed me to further validate the k-means clusters, given that each analysis uses different methods to arrive at a solution. Moreover, using the k-means cluster analysis allowed me to find relatively homogenous groups based on participants' emotional presentation, while maximizing the differences between the groups.

The present study only included the early session (i.e., sessions 4-6) emotion codes, entered as proportions of expressed emotion, in the cluster analyses to create profile groups. Therefore, clusters were based on clients' early emotional presentation during therapy. All three early expressions of distress were used in the cluster analysis (i.e., Global Distress, Shame/Fear, and Rejecting Anger). Also, three adaptive emotion states were included: Assertive Anger, Self-Compassion, and Hurt/Grief. Given the exploratory nature of cluster analysis, the emotion codes

were entered in two ways to find the best solution: 1) all six emotion codes were entered as separate variables; 2) three early expressions of distress were entered separately and the three adaptive emotion codes were compiled into an "Adaptive Emotion" variable. The latter combination of "Adaptive Emotion" variables was created due to the low incidence of adaptive emotions in early sessions (average proportion is ≤ 5% per variable; see Table 4).

Hypothesis 1(b): Identifying Features of BPD Emotion Profiles

After running the cluster analysis on early sessions, a set number of groups were identified. Then, a series of one-way ANOVAs and non-parametric tests were run to determine whether the emotions profile groups are significantly different from each other based on the proportion of time each group spent in each emotion. Finally, both the pattern of significant differences between groups and descriptive statistics were interpreted to determine the characteristics of each group's emotion profile (such as mean proportion of time spent in each emotion type and relative differences between profiles). In this way, the groups were classified and named based on their emotion profiles, that is, their characteristic observed emotion presentation in an early therapy session.

Hypothesis 1(c): Differences in Baseline Symptoms Between Groups

Differences in baseline symptoms were analyzed using chi-square tests and a series of analyses of variance tests. These analyses helped to validate the subtypes, such that significant differences between the groups in baseline symptoms demonstrate that differences between the groups extend beyond the variations in their emotion profiles. To maintain the exploratory aims of the present study, Bonferroni corrections were used only for multiple comparisons within each chi-square test and each analysis of variance test. Differences between the groups were analyzed for three binary variables: presence of self-harm, presence of suicide attempts, and employment

status. The following overall scales and their subscales were included baseline symptom variables in separate analyses of variance: BSL (borderline symptoms), SCL-90-R (psychological symptoms), IIP-64 (interpersonal problems), SAS-SR (employment), DERS (emotion dysregulation), STAXI (state and trait anger) and KIMS (mindfulness skills).

Hypothesis 2: Subtypes Are Stable Across Time Between and Within Groups

In order to determine whether the identified emotion profiles are stable across time spent in therapy, analyses of variance and/or non-parametric tests (i.e., Kruskal-Wallis Test) were run to look at differences between the groups (that were identified in the cluster analysis) across emotions in middle and late sessions. Differences between the groups in the middle and late session were compared against differences in the early session to determine whether differences between the groups are stable over time. Moreover, repeated measures analysis of variance and/or non-parametric tests for dependent data (i.e., Friedman Test) explored whether levels of each emotion within groups differed across early, middle, and late session timepoints. The Friedman Test is similar to other non-parametric tests in that it compares the mean ranks between profile across time points. Thus, analyses were run between groups in middle and late sessions, as well as within groups across the three time points. The choice between analysis of variance versus non-parametric tests depended on whether a given emotion code was normally distributed across the three groups for each timepoint. On the one hand, if significant differences remain between the groups' emotion profiles in the middle and late sessions, it could indicate the stability of each group's emotional processing style within therapy. Moreover, if each group's emotional presentation remains consistent across the early, middle, and late sessions, this would also speak to the stability of emotional presentation over the course of treatment. On the other hand, any changes in emotion profiles over time could demonstrate ways in which the working

(i.e., middle session) and termination (i.e., late session) phases of treatment impact how each group works through emotions in therapy.

Hypothesis 3: Emotion Profile Groups Relate to Treatment Outcome at 6- and 12-Months

The primary outcome variables were a binary measure of the presence or absence of self-harm and suicide attempts created using the SASII. A chi-square test analyzed differences in the two binary outcomes between the emotion profile groups at 6-months, and 12-months of treatment. An additional binary outcome looking at rates of employment in each group was also investigated using a chi-square test. Moreover, six baseline symptom measures, including their subscales, were used to look for differences between profiles across the 6- and 12-month timepoints. Outcome measures were used as the dependent variables in separate analyses of variance tests including measures of BPD symptoms, psychological symptoms, interpersonal difficulties, difficulties with emotion regulation, measures of trait anger, and mindfulness skills. The identified emotion profile groups were the independent variables in these analyses.

CHAPTER III

Results

Descriptive Statistics for Emotion Proportions

The mean levels of each emotion proportion for the entire sample, as well as the normality of each emotion was examined. The mean of each emotion can be expressed as an average percentage relative to other emotions expressed in the early session (i.e., session 4-6). The following means for each emotion across the entire sample were found: Global distress had an average of 49% (S.D. = .28); Shame/Fear had an average of 27% (S.D. .22); Rejecting Anger had an average of 7.4% (S.D. = .17); Assertive Anger had an average of 5% (S.D. = .13); Self-Compassion had an average of 5% (S.D. = .12); and Hurt/Grief had an average of 3.7% (S.D. = .10). Shapiro-Wilk tests showed that only global distress is normally distributed ($p = .15$). All other emotion proportions were significantly different from normal ($p < .001$).

Hypothesis 1: BPD Emotion Profiles Can Be Identified based on Observed Emotion

Hypothesis 1(a): Cluster Analyses Will Identify Emotion Profiles

The total time spent in a given emotional state (based on the CAMS codes) was divided by the total time spent across all emotion states in that session. Thus, a proportion of time spent in each emotion relative to the total time spent experiencing emotion in that session was created for each emotion for each participant's early sessions. Only early session emotion codes were used in the hierarchical and k-means cluster analyses. An initial set of hierarchical and k-means cluster analyses were run using all six emotion codes separately, but the two analyses did not converge on one solution. Instead, proportional data for the following emotion states were included in a subsequent hierarchical and k-means cluster analyses: (1) global distress, (2) fear/shame, (3) rejecting anger, and (4) adaptive emotion.

The hierarchical analysis used the Ward linkage method, a common approach to cluster analysis that tends to produce balanced groupings (Bardhoshi et al., 2020). Additionally, Euclidean squared distance was used to assess distance scores between cases (participants) across emotion variables and thus organized the data into groupings. The hierarchical cluster analysis created a series of groupings visualized in a dendrogram (Appendix A). The cut-off point that determines at which level the groups are extracted was analyzed through visual inspections to maximize differences between the groups. Visual inspections showed two potential cut-off points: creating either two groups or three groups had greater than 5 distance scores at which the groups fused. This means that they are maximizing dissimilarity between the groups. Both solutions were examined to assess which would best account for differences across emotion between groups. The three-group solution was chosen because it maximizes differences between groups across a wider range of emotions (see Table 5). In contrast, the two-group solution created two groups that differed solely on their levels of Global Distress. Additionally, the k-means analysis using a three-group solution was a more stable solution compared to a two-group solution; the three-group solution converged after four iterations, whereas the two-group solution converged after six iterations. Slow convergence can indicate that the number of groups were wrongly specified and do not represent the data well (Marriott, 1982).

Hypothesis 1(b): Identifying Features of Emotion Profile Groups

The three-group solution was cross-validated by examining the differences between the groups across the six emotions using the Kruskal-Wallis H test, a non-parametric omnibus test that looks for differences between groups based on their average ranks on a given variable. In this case, the Kruskal-Wallis H test ranked all cases based on their emotion proportion scores and then compared the average ranks between the two groups. The Kruskal-Wallis H test was

conducted because all emotion codes, except for Global Distress, violate the assumptions of normality and homogeneity of variances. Given that cluster analysis maximizes differences between groups based on the emotion variables, it is expected that emotions will not be normally distributed, and variances will not be equal, given that groups often have low levels of a given emotion, indicating a floor effect. The Kruskal-Wallis H test showed significant differences between the three emotion profiles across all emotions (see Table 5), except for rejecting anger ($p = .12$). Post-hoc tests were run using a Bonferroni correction to determine the differences between pairs of profiles across each emotion. Thus, all post-hoc p-values reported in the present study are corrected, unless otherwise stated. Only patterns of significant differences are reported here.

Group 1 had significantly higher Global Distress compared to Group 2 ($p < .001$) and Group 3 ($p < .001$). Group 2 had significantly higher Shame/Fear compared to Group 1 ($p < .001$) and Group 3 ($p < .001$). Group 3 had significantly higher Assertive Anger compared to Group 1 ($p = .002$) and Group 2 ($p = .013$). Group 3 had significantly higher Self-Compassion compared to Group 1 ($p = .002$) and marginally higher levels compared to Group 2 ($p = .075$). Group 3 had significantly higher Hurt/Grief compared to Group 1 ($p = .013$). Finally, when considering Adaptive Emotions together as one category, Group 3 had the highest levels compared to Group 1 ($p < .001$) and Group 2 ($p = .001$). Although, there were no significant differences in Rejecting Anger across the groups, when considering both Rejecting Anger and Assertive Anger together, there were significant differences between the groups ($p < .001$). The anger codes were considered together given the conceptual similarity. Group 3 had significantly higher levels of Overall Anger compared to the Distressed group ($p = .005$) and to the Ashamed

group (p = .002). Figure 1 shows the proportions of each emotion in the profile of each group. Table 6 shows the mean and standard deviations of emotion proportions for each group.

Table 5

Kruskal-Wallis H Test Results

Emotion Type	K-W H statistic	df	p-value
Global Distress	39.671	2	< .001*
Shame/Fear	27.039	2	< .001*
Rejecting Anger	4.220	2	.121
Assertive Anger	13.431	2	.001*
Self-Compassion	11.696	2	.003*
Hurt/Grief	8.086	2	.018*
Adaptive Emotion	29.087	2	< .001*
Overall Anger	14.327	2	< .001*

* p-values below .05.

The first cluster was composed of n = 26, making up 48% of the total sample. The mean levels of emotion, as a proportion of expressed emotion in the early session, were as follows: Global Distress was expressed 75% of the time (S.D. = .15); Shame/Fear was expressed 20% of the time (S.D. = .13); Rejecting Anger was expressed 4% of the time (S.D. = .09); Assertive Anger was expressed 1% of the time (S.D. = .03); Self-Compassion was expressed 1% of the time (S.D. = .02); and Hurt/Grief was expressed 0.1% of the time (S.D. = .01). Given the fact that this group had significantly higher levels of Global Distress than the other groups, and this seemed to be its identifying feature, this group will be called the "Distressed Group."

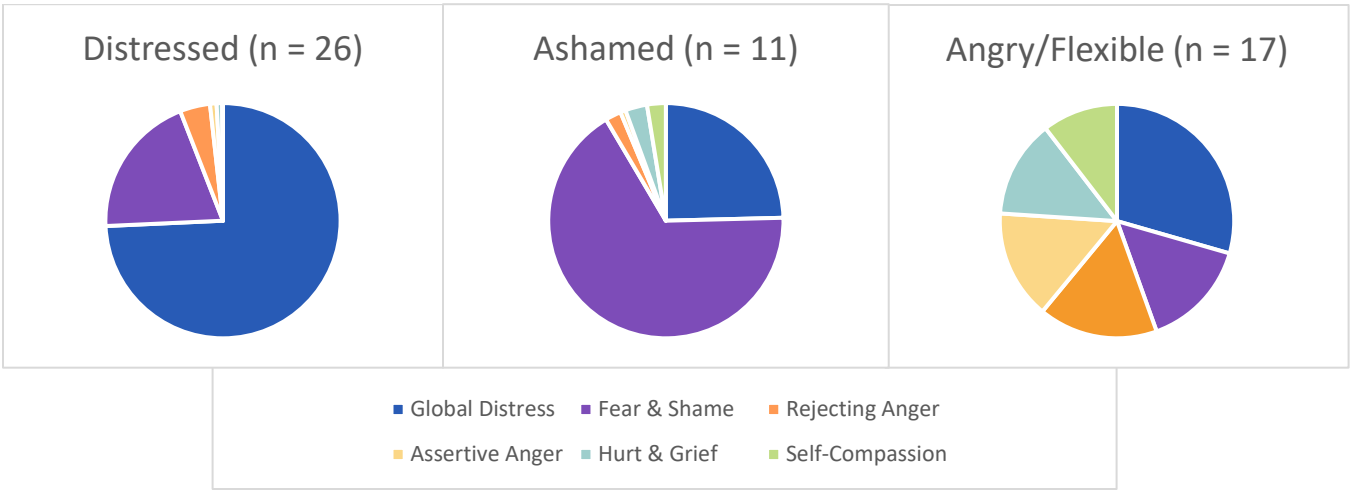
The second cluster was composed of n = 11, making up 20% of the total sample. The mean levels of proportions of emotion were as follows: Global Distress was expressed 24% of

the time (S.D. = .16); Shame/Fear was expressed 64% of the time (S.D. = .09); Rejecting Anger was expressed 2% of the time (S.D. = .07); Assertive Anger was expressed 1% of the time (S.D. = .02); Self-Compassion was expressed 3% of the time (S.D. = .08); and Hurt/Grief was expressed 2% of the time (S.D. = .06). This group had the highest levels of Shame/Fear compared to the other groups; thus, this group will be called the "Ashamed Group."

The third cluster was composed of n = 17, making up 32% of the total sample. The mean levels of proportions of emotion were as follows: Global Distress was expressed 28% of the time (S.D. = .15); Shame/Fear was expressed 14% of the time (S.D. = .13); Rejecting Anger was expressed 16% of the time (S.D. = .07); Assertive Anger was expressed 14% of the time (S.D. = .21); Self-Compassion was expressed 13% of the time (S.D. = .19); and Hurt/Grief was expressed 10% of the time (S.D. = .16). Additionally, when taking Rejecting Anger and Assertive Anger together, the third group expressed Overall Anger 30% of the time. This group expressed the highest levels of Assertive Anger compared to the other groups. They also expressed higher levels of Adaptive Emotions (37%, S.D. = .23) and Overall Anger (30%, SD = .29) compared to the other groups, so this group will be called the "Angry/Flexible Group." This group's name can be attributed to the fact that anger is the most salient emotion expressed by these clients, and being emotionally *flexible* is another idiosyncratic feature of this group's emotion profile (i.e., they express relatively similar amounts of each emotion type, including early expressions of distress and adaptive emotions). It is important to note here that the label of "Angry" does not solely imply typical notions of anger ("Rejecting Anger") but highlights adaptive forms of anger as well ("Assertive Anger"). The term "flexible" is meant to underscore clients' flexibility in their use of a wide range of emotions, including adaptive emotions, despite displaying *early expressions of distress* in moderate amounts on average.

Figure 1

Proportions of Emotions for Each Profile



Hypothesis 1(c): Differences in Baseline Symptoms Between Groups

Three Chi-Square tests were run to assess differences between the three groups of emotion profiles based on the following binary variables that examined the presence of the following: self-harm behaviours, suicidal behaviours, and employment status. Chi-square tests were chosen although, at times, cells in the cross tabulation had expected counts less than 5, an often-used lower bound for chi-square tests. However, simulation studies have shown that this lower bound is likely too conservative for 2x2 contingency tables, especially when it comes to comparative trials designs (Campbell, 2007). This simulation study also showed that Fisher's exact test was too conservative. It is likely that this logic extends to 3x2 contingency tables, which is the design of the present study. Thus, I will use the (N-1) chi-square distribution correction as suggested by Campbell (2007) for the overall chi-square and pairwise comparisons whenever expected counts are less than 5.

When looking at the presence of self-harm behaviours, there were no significant differences between the groups at baseline ($[N-1]\chi^2[2]$ = .905, p = .636). As well, there were

no differences between the groups when looking at the presence of suicide attempts ([N-1]χ^2[2] = .769, p = .681; See Table 7 for a summary of binary outcomes at baseline). This means that there were no differences between the groups regarding the number of people who had at least one episode of self-harmed or who attempted suicide. In contrast, there were significant differences between the groups based on whether a participant was employed ([N-1]χ^2[2] = 9.523, p = .009). Post-hoc tests showed that the Angry/Flexible Group had a significantly higher proportion (65%) of employed members than the Ashamed Group (9%; [N-1]χ^2[1] = 8.134, p = .012). The Angry/Flexible Group had a marginally higher proportion of employed members compared to the Distressed group (31%; [N-1]χ^2[1] = 4.689, p = .09). There were no significant differences between the Distressed Group and the Ashamed Group ([N-1]χ^2[1] = 1.920, p = .498).

A series of one-way analysis of variance were run using measures of borderline symptoms (BSL-23), psychological symptoms (SCL-90-R), interpersonal difficulties (IIP-64), employment (SAS-SR), difficulties with emotion regulation (DERS), mindfulness skills (KIMS), and measures of trait anger (STAXI). Normality was assessed for each measure and subscale across each group. The Shapiro-Wilk test indicated that all scales and subscales were not significantly different from normal in each group, except for one instance of non-normality (i.e., angry reaction temperament). Across all of the variables, the skewness and kurtosis had an absolute value less than two, suggesting that normality is adequate (Pituch & Stevens, 2016). Therefore, normality was deemed appropriate for the tests of analysis of variance. Additionally, when outcome variables had significantly different variances across the three groups, the Welch's correction was used. Post-hoc tests were run using Bonferroni corrections for each individual test.

There were no significant differences between the groups regarding borderline symptoms (F [2, 51] = 1.431, p = .248). In terms of global severity of psychological symptoms on the SCL-90, there were no significant differences between the groups (F[2, 51] = 1.059, p = .354). Analysis of variance showed marginally significant differences between the groups regarding overall levels of interpersonal problems using the Welch's correction (W [2, 31.45] = 3.22, p = .053). Games-Howell post-hoc tests showed significantly higher levels of interpersonal problems for the Distressed Group (M = 132.31; S.D. = 36.35) compared to the Ashamed Group (M = 109.00; S.D. = 19.1; p = .041). Moreover, an analysis of variance showed significant differences between the groups in a measure of the mindfulness skill "observing" (F [2, 51] = 3.168, p = .05, ω^2 = .074). Bonferroni-corrected post-hoc tests demonstrated marginally higher levels of observing (p = .063) in the Angry/Flexible Group (M = 40.76, S.D. = 8.87) compared to the Ashamed Group (M = 32.55, S.D. = 8.85).

In an overall measure of Trait Anger, an analysis of variance showed significant differences between the groups (F [2, 51] = 9.58, p < .001, ω^2 = .241). Post-hoc tests showed significantly higher levels of Trait Anger in the Distressed Group (M = 30.85, S.D. = 4.69, p < .001) and the Angry/Flexible Group (M = 29.82, S.D. = 5.69, p = .003) when compared to the Ashamed Group (M = 22.45, S.D. = 5.96). A similar pattern of effects was found across the four subscales of Trait Anger. For the Angry Temperament subscale, there were significant differences between the groups (F[2, 51] = 6.21, p = .004, ω^2 = .162). Post-hoc tests showed significantly higher levels of Angry Temperament in the Distressed Group (M = 12.58, S.D. = 2.87, p = .003) and the Angry/Flexible Group (M = 11.82, S.D. = 2.90, p = .039) when compared to the Ashamed Group (M = 9.00, S.D. = 2.65). For the Angry Reaction subscale, there were significant differences between the groups (W[2, 25.93] = 7.50, p = .003, ω^2 = .211). Post-hoc

tests showed significantly higher levels of Angry Reaction in the Distressed Group (M = 13.08, S.D. = 2.94, p < .001) and the Angry/Flexible Group (M = 12.53, S.D. = 1.88, p = .008) profiles when compared to the Ashamed Group (M = 9.36, S.D. = 2.66). For the Angry Expression Out subscale, there were significant differences between the groups (F[2, 51] = 3.31, p = .044, ω^2 = .079). Post-hoc tests showed marginally higher levels of Anger Expression Out for the Distressed Group (M = 21.96, S.D. = 4.61, p = .084) and the Angry/Flexible Group (M = 22.53, S.D. = 4.78, p = .059) when compared to the Ashamed Group (M = 18.09, S.D. = 5.09). Finally, the Anger Expression In subscale also showed significant differences between the groups (F[2, 51] = 3.32, p = .044, ω^2 = .079). Post-hoc tests showed significantly higher levels of Angry Expression-In for the Distressed Group (M = 23.88, S.D. = 3.70) when compared to the Ashamed profile (M = 20.09, S.D. = 3.70, p = .043), but no significant differences when comparing these groups to the Angry/Flexible Group (M = 23.29, S.D. = 5.01).

An additional set of chi-square analyses were conducted to investigate whether the presence of a given comorbid disorder diagnosis may otherwise explain the observed emotion profiles that had determined group membership. Results showed no significant differences between the groups across a range of disorders for both lifetime and current comorbid diagnoses (i.e., depression, bipolar, generalized anxiety, panic, OCD, substance use, and eating disorders), except for PTSD. Regarding current PTSD, there were significant differences between the three groups ([N-1]χ^2[2] = 13.897, p < .001). Post-hoc tests showed a significantly higher proportion of people comorbidly diagnosed with PTSD in the Ashamed Group (73%) compared to both the Distressed Group (12%; [N-1]χ^2[1] = 13.276, p < .001) and the Angry/Flexible Group (24%; [N-1]χ^2[1] = 6.601, p = .01), at a Bonferroni-corrected significance level of p = .017. There were no significant differences between the Distressed Group and the Angry/Flexible Group ([N-

1]χ^2[1] = .950, p = .30). Additionally, there were significant differences between the groups for lifetime PTSD diagnosis ([N-1]χ^2[1] = 9.287, p = .009). Post-hoc tests showed a significantly higher proportion of individuals with a lifetime PTSD diagnosis in the Ashamed Group (91/%) compared to the Distressed Group (36%; [N-1]χ^2[1] = 8.98, p = .003). There were no significant differences between the Angry/Flexible Group (59%) compared to the Ashamed Group ([N-1]χ^2[1] = 3.25, p = .07) and when compared to the Distressed Group ([N-1]χ^2[1] = 2.08, p = .15).

Finally, differences between groups regarding gender were investigated through a chi-square analysis. The results showed no significant differences in the proportions of gender between groups (χ^2[2] = 4.816, p = .307). In fact, the distribution of genders per group were as follows: the Distressed Group was made up of 81% females, 15% males, and 4% "other"-identified; the Ashamed Group was made up of 82% females and 18% males; and the Angry/Flexible Group was made up of 59% females, 23% males, and 18% "other"-identified.

Hypothesis 2: Profiles Are Stable Across Time Between and Within Groups

In order to look for differences in emotion between the three groups across the middle and late sessions, the Kruskal-Wallis H test was used. Across all emotions in the middle and late sessions, at least two groups violated non-normality per emotion type, thus a non-parametric test was more appropriate than an analysis of variance. Moreover, the Friedman test was used to investigate differences in emotion across timepoints within each of the groups, given that it is a non-parametric test for dependent samples. A list of all proportions across time points is given in Table 6.

Differences Between Groups During Middle Sessions

For the middle time point (sessions 11-13), there were significant differences between the groups in Rejecting Anger (H [2] = 7.33, p = .026). Post-hoc tests showed significantly greater levels of Rejecting Anger for the Angry/Flexible Group (M = .15, S.D. = .18) compared to the Ashamed Group (M = .02, S.D. = .07; p = .024). Moreover, there were significant differences between the groups when looking at total levels of adaptive emotion (H [2] = 7.91, p = .019). Post-hoc tests showed significantly greater levels of Adaptive Emotion for the Angry/Flexible Group (M = .23, S.D. = .26) compared to the Distressed Group (M = .06, S.D. = .13; p = .028). The Angry/Flexible Group also had marginally greater levels of Adaptive Emotion compared to the Ashamed Group (M = .08, S.D. = .17; p = .085). However, there were no significant differences between the groups in Global Distress (H [2] = 3.89, p = .143), Shame/Fear (H [2] = 3.27, p = .195), Assertive Anger (H [2] = 4.54, p = .103), Self-Compassion (H [2] = 4.43, p = .109), or Hurt/Grief (H [2] = 3.33, p = .189).

Differences Between Groups During Late Sessions

Analyses looking at the late session time point (sessions 25-27) showed significant differences between the groups for Shame/Fear (H [2] = 9.58, p = .008). Post-hoc tests indicated that the Ashamed Group (M = .54, S.D. = .25) had significantly greater levels of Shame/Fear compared to the Distressed Group (M = .25, S.D. = .28; p = .008) and compared to the Angry/Flexible Group (M = .25, S.D. = .28; p = .034). Furthermore, there were significant differences between the groups for Rejecting Anger (H [2] = 10.14, p = .006). Post-hoc tests showed significantly higher levels of Rejecting Anger for the Angry Adaptive Group when compared to the Ashamed Group (p = .004). As well, the Distressed Group had marginally higher levels of Rejecting Anger compared to the Ashamed Group (p = .109). There were

marginally significant differences between the groups in terms of Adaptive Emotion (H [2] = 5.61, p = .061), with the Angry/Flexible group having marginally higher levels compared to the Distressed group (p = .054). There were no significant differences between the groups for Global Distress (H [2] = 4.14, p = .126), Assertive Anger (H [2] = 4.16 p = .125), Self-Compassion (H [2] = .47, p = .792), and Hurt/Grief (H [2] = 4.16, p = .125).

Significant Changes Within Each Group Across Session Time Points

Distressed Group. The Friedman Test was used as a substitute for a repeated measures analysis of variance due to the non-normality of the data. There were significant changes in Self-Compassion for the Distressed Group from the first to last observation time points (χ^2[2] = 7.46, p = .024). However, post-hoc tests indicated no significant changes between each pair of time points. Additionally, there were significant changes in Adaptive Emotion for the Distressed Group (χ^2[2] = 8.04, p = .018). Post-hoc tests showed significant increases in Adaptive Emotion between the early and late sessions (p = .020). There were marginal increases in Adaptive Emotion is between the early and middle sessions (p = .059) and no differences between the middle and late sessions (p = .433).

Ashamed Group. There were significant changes in Global Distress across the three time points for the Ashamed Group (χ^2[2] = 6.47, p = .039). Post-hoc tests showed significant increases in Global Distress from the early session to the middle session (p = .021), as well as significant decreases from the middle session to the late session (p = .037). There were no significant differences in Global Distress from the early to the late session (p = .213). Moreover, there were significant changes in Shame/Fear across time points for the Ashamed Group (χ^2[2] = 6.55, p = .038). Post-hoc tests showed significant decreases in Shame/Fear from the early to

the middle session (p = .013). There were no significant changes in Shame/Fear from the middle to the late session (p = .110) or from the early to the late session (p = .131).

Angry/Flexible Group. There were no significant changes in levels of each emotion across the early, middle, and late session for the Angry/ Flexible group.

Table 6

Summary of Average Emotion Proportions for Each Profile by Time Points

Therapy Timepoint	Variables	Distressed (n = 26)		Ashamed (n = 11)		Angry/Adaptive (n = 17)		Total (N = 54)	
		M	S.D.	M	S.D.	M	S.D.	M	S.D.
Early Session	Global Distress	.74	.15	.24	.16	.28	.15	.49	.28
	Fear/Shame	.20	.13	.64	.09	.14	.13	.27	.22
	Rejecting Anger	.04	.09	.02	.07	.16	.26	.07	.17
	Assertive Anger	.01	.03	.01	.02	.14	.21	.05	.13
	Self-Compassion	.01	.02	.03	.08	.13	.19	.05	.12
	Hurt/Grief	.00	.01	.02	.06	.10	.16	.04	.10
	Adaptive Emotion	.02	.03	.06	.10	.37	.23	.14	.21
Middle Session	Global Distress	.59	.32	.50	.33	.40	.28	.51	.31
	Fear/Shame	.23	.27	.39	.29	.24	.22	.27	.26
	Rejecting Anger	.07	.15	.02	.07	.14	.17	.08	.15
	Assertive Anger	.04	.10	.04	.08	.12	.22	.06	.15
	Self-Compassion	.02	.06	.01	.02	.04	.06	.02	.05
	Hurt/Grief	.02	.08	.03	.08	.06	.09	.03	.08
	Adaptive Emotion	.07	.15	.08	.17	.21	.25	.12	.20
Late Session	Global Distress	.54	.35	.33	.25	.36	.32	.44	.33
	Fear/Shame	.24	.28	.54	.25	.25	.28	.31	.29
	Rejecting Anger	.10	.14	.00	.01	.14	.16	.09	.14
	Assertive Anger	.04	.10	.06	.10	.11	.13	.07	.11
	Self-Compassion	.03	.05	.02	.04	.05	.09	.03	.06
	Hurt/Grief	.01	.04	.04	.08	.08	.13	.04	.09
	Adaptive Emotion	.08	.14	.12	.15	.24	.24	.14	.19

Hypothesis 3: Emotion Profile Groups Relate to Treatment Outcome at 6- and 12-Months

Outcomes at Six Months

Chi-square tests explored differences between the three groups on the presence or absence of self-harm behaviours, suicide attempts, and whether participants were employed at the six-month timepoint. There were no differences between the groups regarding the presence of self-harm ([N-1]χ^2[2] = 1.22, p = .542, suicidal behaviours ([N-1]χ^2[2] = .297, p = .862), or employment ([N-1]χ^2[2] = 3.894, p = .143). See Table 7 for total counts of binary outcomes per group.

A series of analysis of variance tests explored significant differences between the groups at the 6-month timepoint (See Appendix B for a summary of all omnibus tests). There were no significant differences between the groups in terms of borderline symptoms at 6-months of treatment (F[2, 51] = .291, p = .748) and overall psychological dysfunction (F[2, 51] = 1.183, p = .315). However, the Hostility subscale in the SCL-90 showed significant differences between the groups (W[2, 30.24] = 4.14, p = .026, ω^2 = .094). Post-hoc tests showed significantly higher levels of Hostility in the Distressed Group (M = 1.62, S.D. = 1.00) compared to the Ashamed Group (M = .86, S.D. = .58, p = .044). Moreover, there were significant differences between the profiles in their overall levels of interpersonal problems (IIP; F[2, 51] = 4.28, p = .019, ω^2 = .108). Post-hoc tests showed significantly higher levels of interpersonal problems for the Distressed Group (M = 123.35, S.D. = 29.24) compared to the Angry/Flexible Group (M = 97.41, S.D. = 35.60, p = .032). There were significant differences between the groups in the Non-Assertive subscale of the IIP-64 (F[2, 51] = 4.094, p = .022, ω^2 = .103). Post-hoc tests showed significantly higher Non-Assertive scores in the Distressed Group (M = 20.73, S.D. = 6.25) when compared to the Angry/Flexible Group (M = 15.0, S.D. = 6.96, p = .021). There were

also significant differences between the groups in the Overly Accommodating subscale of the IIP-64 (F [2, 51] = 4.25, p = .020, ω^2 = .108). Post-hoc tests indicated significantly higher Overly Accommodating scores in the Distressed Group (M = 17.46, S.D. = 5.41) when compared with the Angry/Flexible Group (M = 12.47, S.D. = 6.08, p = .025). Similarly, there were significant differences between the groups in the Self-Sacrificing subscales of the IIP-64 (F [2, 51] = 3.57, p = .035, ω^2 = .087). Post-hoc tests demonstrated that the Distressed Group (M = 18.04, S.D. = 5.76) had significantly higher Self-Sacrificing scores when compared to the Angry/Flexible Group (M = 12.06, S.D. = 6.69, p = .039).

Given the differences in measures of interpersonal problematic styles, paired samples t-tests were conducted to measure the degree of changes in scores at 6-months compared to baseline. Only the Angry/Flexible Group had significant changes in their levels of interpersonal problems (see Appendix B for a summary of mean scores across outcome measures). Regarding overall levels of interpersonal problems, the Angry/Flexible Group had significant decreases at 6-months when compared to baseline (t[16] = 2.402, p = .029, *d* = .583). Additionally, they had significant decreases in the non-assertiveness subscale at 6-months when compared to baseline (t[16] = 2.729, p = .015, *d* = .662).

The overall measure of Trait Anger indicated significant differences between the groups (F[2, 51] = 4.97, p = .011, ω^2 = .128). Post-hoc tests demonstrated significantly higher levels of Trait Anger in the Distressed Group (M = 28.92, S.D. = 21.91, p = .010) and the Angry/Flexible Group (M = 27.94, S.D. = 6.14, p = .05) when compared to the Ashamed Group (M = 21.91, S.D. = 5.80). The Angry Reaction subscale showed significant differences between the groups (F[2, 51] = 6.26, p = .004, ω^2 = .163). Post-hoc tests showed significantly higher levels of Angry Reaction in the Distressed Group (M = 12.58, S.D. = 2.63, p = .003) and the Angry/Flexible

Group (M = 12.12, S.D. = 2.18, p = .025) when compared to the Ashamed Group (M = 9.55, S.D. = 2.25).

Outcomes at Twelve Months

End of treatment outcomes were assessed at 12-months after the start of treatment. Chi-square tests demonstrated significant differences between the groups based on the presence of self-harm ([N-1]χ^2[2] = 6.014, p = .049). Post-hoc tests showed marginally higher proportions of members who engaged in self-harm in the Ashamed Group (64%) at the end of treatment when compared to the Distressed Group (23%; [N-1]χ^2[1] = 5.43, p = .06) and the Angry/Flexible Group (27%; [N-1]χ^2[1] = 3.42, p = .19). Given the high rates of PTSD in the Ashamed Group, I explored whether the presence of PTSD would better explain the high rates of self-harm in the Ashamed Group after 12-months of treatment. There was no association between PTSD and self-harm at the end of treatment ([N-1]χ^2[2] = .533, p = .77).

Moreover, there were significant differences between the groups in terms of whether participants were employed ([N-1]χ^2[2] = 6.303, p = .043). Post-hoc tests showed that the Angry/Flexible Group had a marginally greater proportion of members who were employed (66%) at the end of treatment compared to the Ashamed Group (18%; [N-1]χ^2[1] = 5.77, p = .06). Despite differences between the groups in terms of employment at baseline and 12-months, there were no significant changes across baseline, 6-months to 12-months for each of the groups in their rates of employment based on a Cochrane's Q Test. There were also no significant differences between the groups based on the presence of suicide attempts ([N-1]χ^2[2] = 1.788, p = .409). See Table 7 for a summary of binary outcomes at 12 months.

A series of analyses of variance explored significant differences between the profiles at the 12-month timepoint. There were no significant differences between the groups in terms of

borderline symptoms at the end of treatment (BSL-23; F[2, 49] = .416, p = .662). Although there were no significant differences between the groups in terms of their overall interpersonal problems (IIP-64; F[2, 49] = 2.153, p = .127), there were significant differences between the groups in terms of the Socially Inhibited subscale (of the IIP-64; F[2, 49] = 3.778, p = .030, ω^2 = .097). Post-hoc tests showed marginally lower Socially Inhibited scores for the Angry/Flexible Group (M = 12.47, S.D. = 7.71) compared to the Distressed Group (M = 18.23, S.D. = 8.21, p = .069) and to the Ashamed Group (M = 19.82, S.D. = 8.21, p = .055). Additionally, there were significant differences between the groups in terms of their difficulties with emotional awareness, a subscale of the DERS (F[2, 49] = 3.42, p = .041, ω^2 = .085). Post-hoc tests showed marginally less difficulty with emotional awareness for the Angry/Flexible Group (M = 13.07, S.D. = 3.77) compared to the Distressed Group (M = 16.35, S.D. = 5.28, p = .087) and to the Ashamed Group (M = 17.18, S.D. = 3.09, p = .076). Finally, there were significant differences between the groups in terms of Anger Expression In subscale of the STAXI-2 (W[2, 26.22] = 3.53, p = .044, ω^2 = .073). Post-hoc tests showed marginally higher levels of Anger Expression. In for the Distressed Group (M = 23.12, S.D. = 3.70) when compared to the Ashamed Group (M = 20.45, S.D. = 2.70, p = .055).

Differences in Self-Harm Over Treatment Period

To investigate changes in self-harm and employment rates for each group between baseline, 6-month, and 12-month outcomes, a Cochrane's Q Test was conducted. The Cochrane's Q Test is analogous to a chi-square and is designed to determine whether the proportions of an outcome change over repeated measures. There were significant changes in the presence of Self-Harm for the Distressed Group across the three time points (Q [2] = 27.44, p < .001). Post-hoc tests demonstrated significant reductions in the proportions of self-harm between

measurements at baseline (92%) and 12-months (23%, p < .001). Moreover, there were significant reductions in self-harm between the 6-month timepoint (65%) and the 12-month timepoint (p = .004). There were marginal reductions in self-harm between baseline and 6-months (p = .130). For the Ashamed Group, there were no differences in self-harm between the three timepoints (Q [2] = 2.000, p = .368). There were significant changes in the presence of self-harm for the Angry/Flexible Group across the three time points (Q [2] = 11.455, p = .003). Post-hoc tests showed significant reductions in self-harm between baseline (88%) and 12-months (24%, p = .003). There were marginal reductions in self-harm between baseline and 6-months (53%, p = .080). There were no significant differences in the proportion of self-harm between the 6-month and 12-month outcome (p = .804).

Table 7

Summary of Presence of Self-Harm, Suicide, and Employment for Each Group Across Time Points

Time Point	Variables	Distressed		Ashamed & Fearful		Angry/Adaptive		Total	
		%	n	%	n	%	n	%	
Baseline	Self-Harm	96%	24/25	91%	10/11	88%	15/17	92%	49/53
	Suicide	38%	10/25	27%	3/11	29%	5/17	34%	18/53
	Employment	31%	8/26	9%	1/11	65%	11/17	37%	20/54
6-Months	Self-Harm	65%	17/26	73%	8/11	53%	9/17	63%	34/54
	Suicide	15%	4/26	9%	1/11	12%	2/17	13%	7/54
	Employment	31%	8/26	18%	2/11	53%	9/17	35%	19/54
12-Months	Self-Harm	23%	6/26	64%	7/11	27%	4/15	33%	17/52
	Suicide	12%	3/26	9%	1/11	0%	0/15	8%	4/52
	Employment	38%	10/26	18%	2/11	67%	10/15	42%	22/52

CHAPTER IV

Discussion

The present study aimed to investigate whether emotion profiles of clients with BPD could help to explain the heterogeneity within this diagnosis, particularly in their response to a DBT treatment. There is growing interest in the variations within BPD as a group given their differing clinical presentations (Gunderson, 2010; Digre et al., 2009; Sleuwaegen et al., 2017), their responses to therapy (McMain, Fitzpatrick, et al., 2018), and their clinical outcomes (Zeitler et al., 2020). This is the first study to investigate this variability through emotion profiles and, specifically, using an observational measure of expressed emotion. Clients' early therapy sessions were coded through the CAMS to produce measures of emotions expressed during the session. A total of six emotions were used in a cluster analysis: Global Distress, Fear/Shame, Rejecting Anger, Assertive Anger, Self-Compassion, and Hurt/Grief. The total time spent in each emotion was transformed so that a given emotion code was a proportion (i.e., a percentage) of the total expressed emotion in that session. A two-step cluster analytic design identified three distinct emotion profiles groups: a Distressed Group, an Ashamed Group, and an Angry/Flexible Group. Moreover, the stability of emotional presentations for each profile was investigated, as well as the unique outcomes for each group at six and twelve months of treatment.

Summary of Key Findings

The Validity of Three Distinct Emotion profiles of BPD Clients

The first step in the cluster analytic process is to validate the presence of meaningful clusters in a dataset (Hair et al., 2009). Thus, clusters were validated by examining the differences between the groups, describing each profile's characteristic emotions, and by looking at differences between the emotion profile groups in baseline symptomology.

The Distressed Group, making up almost half of the sample (46%), showed significantly higher levels of Global Distress (i.e., secondary symptomatic emotion with high arousal but only vague or general meaning) compared to the other two groups. This group had an average of 75% of their total expressed emotion being Global Distress during the early session. Moreover, the Ashamed Group, representing one fifth of the sample (20%) had significantly higher Shame/Fear (i.e., primary maladaptive emotion that involves highly specific meaning and core negative self evaluations) compared to the other two groups; this group had an average of 64% Shame/Fear in proportion to total expressed emotion during the session. Finally, the Angry/Flexible Group, making up almost one third of the sample (31%) had significantly higher Overall Anger and Adaptive Emotion compared to the other two groups. The Angry/Flexible group had an average of 16% Rejecting Anger (i.e., secondary, reactive anger), 14% Assertive Anger (i.e., healthy, agentic anger), 13% Self-Compassion, and 10% Hurt/Grief in the early session. Thus, hypotheses 1(a) and 1(b) were supported. Based on the observation of early sessions, cluster analysis was able to classify groups, each with unique emotion profiles that are distinct from one another.

In line with hypothesis 1(c) which stated that emotion profile groups should be different on measures of baseline symptoms, clusters were compared on relevant external measures. These comparisons were used to further validate the emotion profile groups found through the cluster analysis. In terms of baseline symptomology, there were significant differences between the groups which are consistent with theory and past research and provide convergent validity for the clusters.

First, a supplementary analysis showed that comorbid diagnoses are generally not related to the cluster groups; thus, subgroups cannot be identified by client's comorbid diagnoses. The purpose of examining relationships between clusters and comorbidities to BPD, was not to

address stated hypotheses but rather to check for possible alternative explanations of the observed subgroups (i.e., divergent validity). These analyses confirm that the subgroups identified based on observed emotion are not an artifact of different diagnostic comorbidities. The within-session presentations of emotion are therefore not systematically attributable, for example, to comorbid depression, anxiety, or other disorders. However, there was one interesting exception. People in the Ashamed Group were more likely to have a current PTSD diagnosis compared to the other groups. It is possible that PTSD is a risk factor for primary maladaptive shame, which corresponds with previous meta-analytic research showing an association between shame and post-traumatic stress symptoms (Lopez-Castro et al., 2019). Although it is possible that comorbid PTSD could explain the Ashamed Group's emotional presentation and subsequent therapeutic outcomes, PTSD cannot be diagnosed based on direct observation. Therefore, the Ashamed Group's primarily ashamed presentation likely is a more proximal and observable therapeutic process, which could aid therapists in better understanding BPD clients who also often experience PTSD symptoms. Furthermore, there were no differences between the groups across their baseline borderline symptom scores. Given that group membership is not generally explained by diagnostic information (e.g., borderline symptom severity, comorbidities), the within-session observations captured by these groups represent unique assessment data.

Significant differences between the groups emerged across a variety of symptom measures which help to illustrate the clinical meaningfulness and validity of the groups. Both the Distressed Group and the Ashamed Group demonstrated lower levels of employment compared to the Angry/Flexible Group. This finding can be explained in two ways. It is possible that the participants with an Angry/Flexible profile have a higher overall baseline resilience compared to the other two profiles given that adaptive emotions often indicate better treatment outcomes

(Pascual-Leone, 2018). One study found that increases in Assertive Anger mediated improved social outcomes at the end of DBT skills training (Kramer, Pascual-Leone, Berthoud, et al., 2016). Thus, BPD clients who can access adaptive emotions and specifically Assertive Anger, may have developed resilience in social contexts, even before the start of therapy. Moreover, the Distressed Group and the Ashamed Group expressed greater levels of early expressions of distress, such as secondary emotions and primary maladaptive emotions, which point to relative emotional vulnerabilities in these two emotion profile groups. This is consistent with prior studies of emotion focused therapy for depressed or socially anxious clients, showing that when they get stuck in these lower-level emotion states it was associated with poorer outcomes at various time frames (Choi et al., 2016; Haberman et al. 2019; Pascual-Leone, 2009). Previous research has indicated that BPD clients have low rates of employment (Hastrup et al., 2020), and approximately 45% remain unemployed at follow up (Sansone & Sansone, 2012), so it is notable that a specific subset of BPD clients (i.e., the Angry/Flexible Group) has a lower risk of unemployment in this study. Overall, it is likely that the Angry/Flexible profile is representative of BPD clients with relatively higher levels of resilience and social functioning compared to the primarily distressed and ashamed emotion profiles. Interestingly, the Angry/Flexible Group also had higher levels of a mindfulness skill called "observing" compared to the Ashamed Group, which coincides with the assumption that the Angry/Flexible Group may be starting out with relatively higher levels of emotional resilience.

Additional baseline differences between the groups were found in terms of measures of trait anger. The Distressed Group and the Angry/Flexible Group showed higher levels of overall trait anger compared to the Ashamed Group. This could indicate that anger, a commonly cited attribute of clients with BPD (e.g., Neukel et al., 2022), is uniquely related to distinct emotion

profiles. Trait anger is made up of four characteristics: an angry temperament, an angry reaction style, an external expression of anger style, and an inward expression of anger style. Across the first three characteristics, both the Distressed Group and the Angry/Flexible Group had significantly higher levels compared to the Ashamed Group. For inward expressions of anger, only the Distressed Group had significantly higher levels compared to the Ashamed Group. Despite having similarly high levels of trait anger, the Distressed Group and Angry/Flexible Group had significantly different levels of Assertive Anger during early therapy sessions. This finding highlights that individuals with BPD who can be described as having high levels of trait anger may be subdivided into those who have a primarily distressed emotion profile at the start of therapy and those who experience more adaptive emotions, particularly an assertive type of anger. Moreover, this analysis showed that the Ashamed Group is exceptionally lacking in markers of anger. This is a novel finding as BPD has often been characterized by anger proneness (Gardner et al., 1991; Jacob et al., 2008), yet this assumption appears to be inconsistent with a subgroup of individuals with BPD that primarily presents with primary maladaptive shame.

Stability & Changes of Emotion profiles Longitudinally

Hypothesis 2 stated that emotion profiles would be stable across early, middle, and late therapy sessions. This hypothesis was partially validated. Across the middle and late time point, some differences in emotions between the groups were maintained. In the middle time point, the Angry/Flexible Group showed greater levels of Adaptive Emotion compared to the other groups. Thus, it appears that six months into treatment, the Angry/Flexible Group can still be differentiated from the other groups in terms of their levels of adaptive emotion. However, the Angry/Flexible Group also showed significantly greater levels of Rejecting Anger compared to

the Ashamed Group. Thus, despite showing greater adaptive emotion, it is likely that the Angry/Flexible Group comes across as distinctly angry in the middle of treatment.

Two groups showed patterns of changes in emotional presentation between the early, middle, and late sessions. The Ashamed Group showed a pattern of increased Global Distress in the middle time point, but subsequently decreased in Global Distress in the late session to similar levels as the early time session. Furthermore, this group decreased in Shame/Fear only in the middle time point, and though there were no significant increases at the late session, qualitative observations show that Shame/Fear levels increased close to baseline levels (i.e., from 64% at baseline, to 39% in the middle session, and back up to 54% in the late session). Thus, it seems that the changes in the Ashamed Group are not indicative of emotional transformation in therapy, but rather it shows that this group may continue to have unresolved shame at the end of therapy. In contrast, the Distressed Group had significant increases in Adaptive Emotion from the early to the late sessions, with most of that change occurring between the early to the middle timepoint. Given that these emotion codes have previously been used as markers of emotional transformation, it is expected that emotion profile groups that process their secondary and maladaptive emotions in depth would demonstrate increased adaptive emotion over the course of treatment, especially when their initial presentation is consistent with early expressions of distress. The theory of Emotion Focused Therapy purports that individuals need to process early expression of distress such as secondary emotion and primary maladaptive emotion in order to improve emotional functioning and to enhance treatment outcomes (Timulak et al., 2015; Goldman & Goldstein, 2022).

Early Emotion Profiles Anticipate the Outcome of Treatment

One of the main contributions of the present study is the finding that self-harm does not decrease for the Ashamed Group at the end of twelve months of DBT. There were no significant changes in the rates of self-harm for the Ashamed Group across the three time points, which means that individuals with an ashamed profile rarely stopped self-harming over the course of 12 months of treatment. Additionally, the Ashamed Group showed marginally greater rates of self-harm compared to the other two groups at 12-months, despite there being no differences between the groups at baseline or 6-month timepoints. Although this finding is marginal, it is possible that a larger sample would have shown a more pronounced difference between the groups in their rates of self-harm given that the observed power for this post-hoc analysis was .50. Indeed, the longitudinal analyses highlight that the groups showed markedly different patterns of recovery in terms of self-harm, given that the Distressed Group and the Angry/Flexible Group showed significantly lower rates of self-harm at the end of treatment compared to the beginning of treatment. Thus, it appears that, according to the primary outcome for the success of this therapy (McMain, Chapman et al., 2018; McMain et al., 2022), the Ashamed Group did not recover in the course of 12-months of DBT, whereas the Distressed and Angry/Flexible group did enjoy significant alleviation in this primary outcome.

In addition, the Ashamed Group had significantly lower rates of employment, specifically 18%, at 12-months compared to the Angry/Flexible Group, which had 67% of members employed. Thus, employment status was an additional indicator that the Ashamed Group did not improve over the course of treatment as they continued to have social functioning difficulties post-treatment that were present at baseline (i.e., only 9% of the Ashamed Group were employed at baseline). In short, clients who could have been identified early in treatment as primarily

ashamed benefited the least from one year of DBT. This finding has important implications for the allocation of treatment resources. Given the cost and effort in treating individuals with BPD for 12 months, the target outcomes do not demonstrate a statistically or clinically meaningful change for clients who were primarily ashamed (e.g., out of 11 participants, only 3 stopped self-harming and only 1 gained employment over the course of treatment).

The current study also revealed differences in symptomology between the Distressed Group and the Angry/Flexible Group at six months. On one hand, the Distressed Group and Angry/Flexible Group had similarly high levels of trait anger when compared to the Ashamed Group at six months. On the other hand, however, the Distressed Group appeared to have higher levels of hostility and overall interpersonal problems. In terms of interpersonal problems, the main characteristics that appeared elevated for the Distressed Group compared to the Angry/Flexible Group were non-assertiveness, overly accommodating tendencies, and self-sacrificing tendencies. This finding shows that despite having similarities in measures of trait anger that persist at six months, the Distressed Group has markers of problematic interpersonal styles when compared to the Angry/Flexible Group. Despite increases in adaptive emotion during the working phase of therapy, the Distressed Group continued to have interpersonal problems and it is possible that the positive effect of integrating adaptive emotions is not seen until the end of treatment. In fact, when looking at the levels of these characteristics at baseline and at six months, measures of social dysfunction were similar for the Distressed Group but showed a moderate decrease for the Angry/Flexible Group at six months. This finding has important implications for a therapists' appraisal of prognosis. Angry clients are stigmatized in part because they are notoriously challenging to work with and typically strain the therapeutic relationship (Aviram et al., 2006; Pascual-Leone et al., 2013; Korman, 2005). However, counter-

intuitively, these interpersonally difficult clients seem to be more likely to make relational/social gains as compared to clients who presented as primarily distressed and overwhelmed with sadness.

Additionally, looking at the changes in self-harm for the Distressed Group, there were significant reductions from baseline to 12-months, with more pronounced reductions occurring between the 6-month outcome and the 12-month outcome. At baseline, 92% of the Distressed Group engaged in self-harm, whereas at 12-months, only 23% of the group had any incidence of self-harm. This is evidence that the Distressed Group seems to recover significantly after the six-month outcome, and therefore may be the group who most stands to benefit from a longer-term treatment (i.e., 12 months; see McMain et al., 2018). Interestingly, the Angry/Flexible Group showed similar changes in self harm, from 88% of members self-harming at baseline to 24% at 12-months. However, post-hoc analyses showed a noticeable reduction in rates of self-harm in the Angry/Flexible Group at 6-months. Thus, the Angry/Flexible Group seems to have a speedier recovery in terms of self-harm compared to the Distressed Group, which is consistent with their reduced levels of interpersonal problems at six months. Finally, although at baseline the Angry/Flexible group was more likely to be employed, none of the 3 groups showed improvement in employment over the course of the 12-month treatment.

There were additional differences between the Angry/Flexible Group and the other two groups based on the outcome measures taken at twelve months. The Angry/Flexible Group showed marginally more emotional awareness and less social inhibition compared to either the Distressed Group or Ashamed Group. These outcomes may be indicators that the Angry/Flexible Group retains advantages compared to the other two groups, particularly in social contexts and in terms of measures related to mindful emotional awareness. However, research with larger

samples is needed to replicate these results. Remarkably, the significant levels of trait anger that were present at earlier timepoints were no longer significant at the 12-month time point, and this was as true for the Distressed Group as for the Angry/Flexible Group. However, there were marginal differences between these Distressed Group and the Ashamed Group in terms of their inward expression of anger. The inward expression of anger trait represents the extent that individuals attempt to suppress their anger (Lievaart et al., 2016). At baseline, the Distressed Group also showed significantly greater inward expression of anger when compared to the Ashamed Group. Internalized expressions of anger tend to be associated with distress and subjective pain (Quartana et al., 2010), which might be why it is associated with the Distressed profile. In fact, emotional suppression has also been linked with negative relationships and identity problems in BPD (van der Kaap-Deeder et al., 2021).

Finally, there were no differences between the groups in terms of borderline symptoms and overall measures of psychological problems at any time points. This indicates that both good and poor outcomes based on such symptoms are represented across all groups such that no difference can be detected. It is possible that these measures are not useful in distinguishing BPD clients' improvements in therapy. However, it is also possible that clients do not improve on such measures over the course of DBT. This is consistent with previous studies that have shown some psychological symptoms do not decrease in DBT for clients with BPD (DeCou et al., 2019). Similarly, although at baseline the Angry/Flexible group was more likely to be employed, none of the three groups showed improvement in employment over the course of the 12-month treatment.

Research & Clinical Implications

Subtypes of BPD can be Identified with the Naked Eye

The first takeaway from this study is that distinct emotion profiles are identifiable for individuals with BPD simply from the observation of emotion in a single session early in therapy. This is the first study to investigate the heterogeneity of BPD in terms of an observable measure of emotional presentations during early therapy sessions. These findings will be interesting to researchers that are looking to explain the variability in BPD and their differing therapy trajectories and outcomes. This observational approach could help clinicians in assessment and treatment planning for their clients if they were trained to identify key emotional presentations. More specifically, clinicians could look for clients who begin treatment as predominantly Globally Distressed, Fearful/Ashamed, or Angry/Flexible based on their observations of emotion in session. Equipped with the present findings, clinicians may quickly assess clients' treatment needs using the profiles identified in this study, particularly as each profile has distinct and characteristic emotions early in treatment. This approach goes beyond observations about borderline symptom severity and comorbid diagnoses; instead, within session observations about emotion profiles offer a new way for clinicians to assess the presenting emotional state of clients and their prognosis for DBT treatment course.

Early Observations Can Anticipate Differential Outcomes

The second key implication of this study is the effectiveness of DBT for BPD may depend on subgroups of clients associated with qualitatively different emotion profiles. The current findings suggest that primarily Distressed and Angry/Flexible clients decrease in their propensity to self-harm, given that significantly less members of each group self-harmed at the end of treatment compared to baseline. The Distressed profile can be identified by the relatively

high levels of Global Distress present in their total expressed emotion in early sessions. The Angry/Flexible profile can be identified by their relatively high levels of anger (both in terms of Rejecting Anger and Assertive Anger) during early sessions. Thus, the two profiles that seem to benefit from DBT can be easily identified by clinicians who are looking to triage patients into DBT treatment, particularly given the fact that these two groups seem to improve more than the Ashamed Group.

Researchers have asked if a full-course of 12-month DBT is necessary for BPD clients and have sought to clarify whether six months of treatment is enough to see a reduction in self-harm (McMain, Chapman, et al., 2018; McMain et al., 2022). Based on the present data, it is likely that individuals with a Distressed profile do require twelve months of treatment, whereas there is some evidence that individuals with an Angry/Flexible profile could benefit from six months of treatment. The caveat to this is that both groups had significantly more members restrain from self-harm after twelve-months of treatment, so it is possible that maximal improvements are seen over a full course of DBT.

Consistent with past research showing increases in adaptive emotion leads to improved therapy outcomes (Pascual-Leone, 2018), the Distressed Group increased in adaptive emotion over 12 months of treatment, which coincided with their reductions in self-harm. Although this study did not explore potential mechanisms of change, one possibility is that when distressed individuals are able to experience adaptive emotion, they reap the benefits of acknowledging their underlying needs. Another possible conclusion is that experiencing more adaptive emotions by late treatment provided Distressed individuals with additional modes of responding to upsetting situations, where initially they primarily responded with Global Distress. Some ways

that DBT may help clients to increase adaptive emotions is by teaching clients mindfulness skills, emotion regulation, and interpersonal skills (Lynch et al., 2007).

Notably, individuals who were initially identified early on as having an Angry/Flexible profile did not seem to show signs of emotion change over the course of DBT. Despite this, the Angry/Flexible group had significant reductions in their self-harm. So, it is unlikely that their early access to adaptive emotions was the main driver of this change. Given that difficulties associated with intense emotional distress, are often underlying self-harm (Chapman et al., 2006), learning DBT strategies to downregulate emotions or developing skills for interpersonal effectiveness may have been useful to this group of clients. Indeed, individuals with an Angry/Flexible profile may benefit from learning how to take advantage of adaptive emotion states through DBT skills. There are signs that these clients start off with greater capacity for mindful awareness and fewer difficulties with awareness of emotions at the end of therapy. Thus, DBT therapists might help them capitalize on their mindfulness skills during treatment to enhance their use of adaptive emotions in everyday life. Alternatively, it is possible that these clients are struggling with their anger, which was salient early in treatment, so practicing assertiveness skills may be particularly helpful (Kramer et al., 2016).

Finally, the most surprising finding from this study is that individuals who present with an Ashamed profile seem not to have improved at the end of therapy in terms of self-harm, the primary outcome. They also do not seem to experience changes in their emotional presentation, beyond experiencing higher levels of Global Distress during the middle of treatment. Based on the sequential model of emotional processing, this signals that ashamed client remained stuck in early expressions of distress (Pascual-Leone, 2018).

Early Observations May be Prognostic Indicators for Treatment Planning

Given the emphasis on identifying clients who benefit from publicly funded treatment and making this therapy cost-effective (McMain, Chapman et al., 2018), it is noteworthy that this study identified a distinct group of clients who did not seem to benefit from the treatment. The eleven individuals who initially presented with an Ashamed profile subsequently received a full course of DBT over the span of one year. One study calculated the average cost of DBT for each participant to be £5,686 (Priebe et al., 2012) – approximately $9,500 CAD. This means that the total resources used for the Ashamed clients was over $100,000, with relatively little benefit. The resources spent in an effort to treat 11 people in the Ashamed Group might have been reallocated to successfully treat 22 more people of the Angry/Flexible Group over 6 months of DBT. While the Ashamed Group would still need attention, this illustration offers one concrete implication. Two potential solutions follow: either DBT should incorporate new ways to work with the primary maladaptive emotion (i.e., shame) that was most characteristic of these clients' early session presentation, or these clients should be triaged into other treatments that specifically target the emotional dynamics of shame, in a way that goes deeper than its behavioral expression. Examples of alternatives may include Mentalization Based Therapy, DBT with Prolonged Exposure, Transference Based Psychotherapy, or Emotion Focused Therapy. Mentalization Based Therapy has been found to be effective at reducing the incidence of self-harm compared to treatment as usual (Storebo et al., 2020). One study suggests that DBT with a Prolonged Exposure protocol could better address shame and trauma related cognitions (Harned et al., 2020). Transference-focused therapy found fewer suicide attempts, improvements in BPD symptomology, and better personality organization compared to treatment as usual. EFT

researchers have also proposed modifications to self-critical chair work that could help to address shame in clients with BPD, as a second line of treatment (Pos & Greenberg, 2012).

In summary, the findings of this study offer some very tentative conclusions on how one might triage clients to available treatment resources. More research is needed, but this study suggests 48% of the sample in a 12-month treatment of DBT for BPD can be identified early in treatment as primarily experiencing and expressing undifferentiated distressed. One can also anticipate that the Distressed Group would benefit in important ways from 12 months of this skills-based treatment. Another 32% of clients in our treatment sample presented as angry in session early in treatment, although they also express some adaptive emotions. We believe therapists would be able to identify this type of client in early sessions and, although they may be challenging to work with, clients like this seem to improve relatively quickly. The lion's share of their gains occurring in the first 6 months, these clients could conceivably be triaged for a shorter term of DBT treatment. Finally, 20% of the sample could be identified from their characteristic expressions of shame and, for the reasons discussed earlier, this groups should probably not be offered DBT. Once again, these initial conclusions remain to be tested more fully.

Limitations & Future Directions

The present study had several limitations. Firstly, the nature of the sample's characteristics posed several concerns. The sample size is low, which poses a limit to the power of statistical analyses. Additionally, the emotional code data in the study is not normally distributed, so non-parametric tests were used. The non-parametric tests used in this study rely on ranking data and comparing average ranks, which may not be easy to compare across other studies. However, the nature of separating individuals based on their key emotions makes it likely that distributions will not be normal for groups when the presence of a given emotion is

low (i.e., a floor effect). Therefore, future research should note that clusters using emotion will likely have non-normal emotion data across clusters.

Secondly, the coding of emotions through an observational measure may have introduced bias. Two emotion codes used in the study had moderate levels of agreement that remained acceptable but were nevertheless markedly lower than that reported in comparison research (see Pascual-Leone, 2018). So future researchers using the CAMS in DBT for BPD should be aware that some emotions, such as Rejecting Anger and Hurt/Grief, may be difficult to code in this treatment/sample combination. It is possible that the difficulty in coding emotions in this sample is partially an artifact of the therapy itself. In fact, observations by the raters noted that therapists were often quick to forestall emotional expression. Thus, in keeping with the approach, DBT therapists may be acting quickly to downregulate emotions rather than facilitating emotional expression, which would offer clearer content for this approach to coding. Consequently, the application of the CAMS may have to be modified in future studies of DBT.

Thirdly, many of the outcome measures were used in an exploratory way, with limited control of Type I error. This decision was made due to the low power associated with the sample and because the cluster approach is inherently exploratory, such that no specific hypotheses related to outcomes were identified in advance. Hence, many measures and subscales were included in the analysis, and it should be noted that null findings were not reported here. Replication will be needed to generalize and validate the current findings.

Likewise, it is unknown whether the present data can generalize to BPD populations with diverse ethnicities given that data on ethnicity was not available. Similarly, 75% of the sample identified as female, so the present findings may not generalize to individuals with other gender identities. Furthermore, the outcomes were self-report in nature which may introduce response

biases due to social desirability and inaccurate self-perceptions (McDonald, 2008). As well, the primary self-harm outcome was a binary variable that looked at the presence and absence of self-harm; thus, there was no indication of the frequency of self-harm, which may remove indications of the severity of self-harm outcomes and its relationship to individual groups.

Future research should consider using the cluster analytic approach with observable measures of expressed emotion in order to validate the present findings using a larger representative sample of BPD clients. Careful training and modifications to the CAMS will likely be needed, such that types of anger are more readily identified, particularly when studying BPD in the context of DBT. Additional outcome measures should be considered when looking at differences between emotion profiles, particularly outcomes related to quality of life and life functioning as these outcomes have been highlighted in past research (Zeitler et al., 2020). The role of the therapeutic context or specific interventions in eliciting expressed emotion was not examined as it was not the focus of this study. The effects of both therapist and treatment approach on the expression of distinct emotion profiles should be studied, as the emotions expressed by clients in therapy occur in an interaction between the client and therapist, within a specific therapy approach. Moreover, anger appeared to be a distinguishing trait of profiles that improved with DBT, so future research may want to focus on different types of anger expression and their usefulness in DBT. Conversely, more research is needed to find out what kinds of therapy processes (if any) might be interfering with clients presenting primarily with shame and fear. Finally, the methodology for identifying emotion profiles through observation and cluster analyses outlined in this study is a novel contribution to the study of emotions in heterogenous samples; future studies may want to investigate other disorders with high degrees of variability using this approach.

Conclusion

The current study explained the heterogeneity in the clinical presentation of BPD through profiles of expressed emotions. These profiles had unique distinguishing emotional presentations and helped to explain a wide range of outcomes for clients who participated in DBT. The finding that only clients with an initial profile of primary maladaptive shame did not improve over the course of therapy emphasizes that this may be a particularly difficult emotion for individuals with BPD to manage. Even though the role of shame has been studied in BPD, the present study highlights that the most popular therapy for this population does not seem to be addressing the concerns of clients whose most salient presentation is primary maladaptive shame. For clinicians, having training in identifying emotion profiles will contribute to a fuller assessment in the treatment of BPD. The present study emphasizes the important role of emotional processing in therapy and extends the sequential model of emotional processing in a new method for identifying clients' emotional profiles early in therapy.

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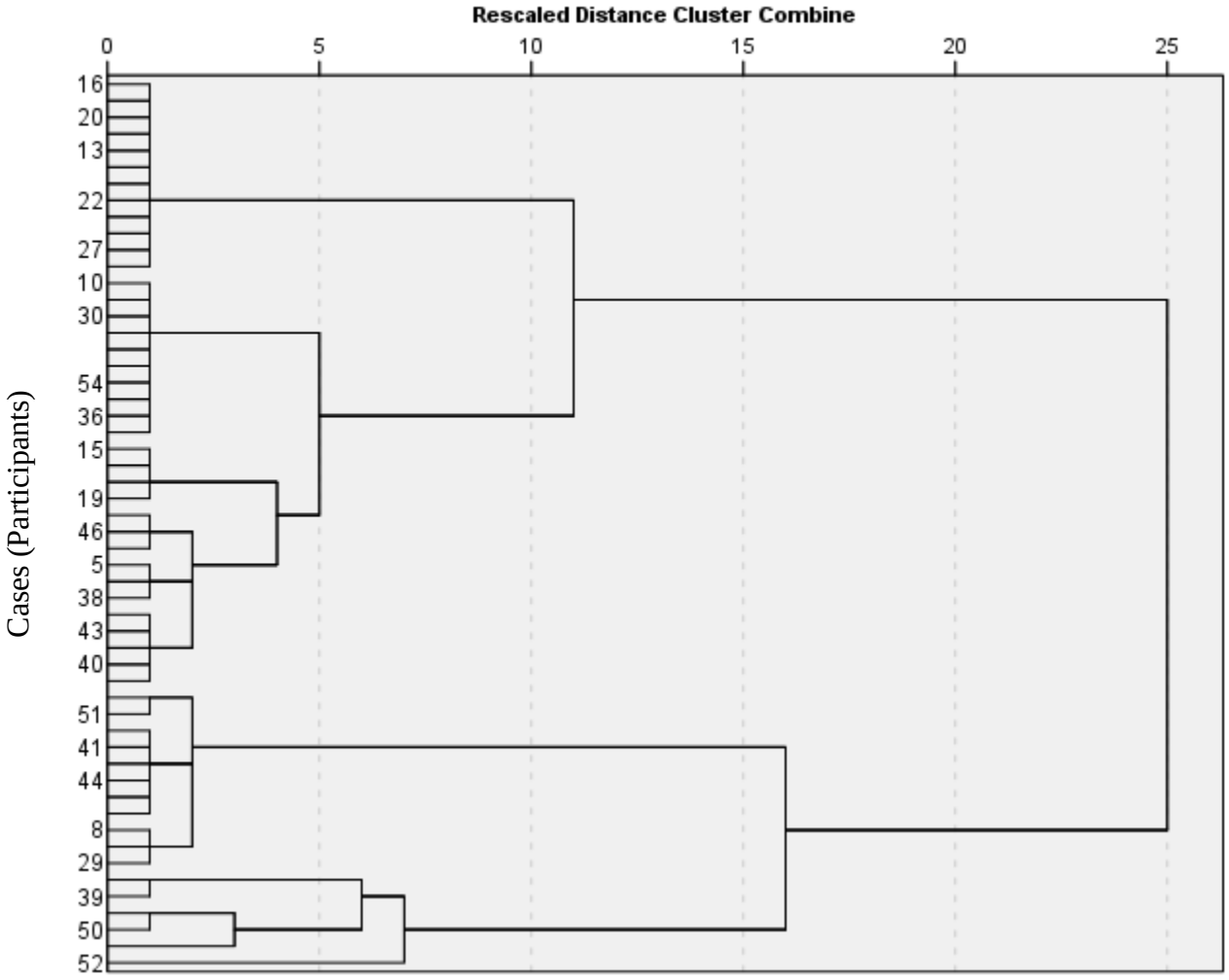
APPENDICES

Appendix A

Dendogram for Hierarchical Cluster Analysis



Note. Dendogram representing the joining of cases and clusters for the hierarchical cluster analysis.

Appendix B

Summary of ANOVA Outcome Results

Summary of variable means, standard deviations, and ANOVA significance value among the three clusters groups, as observed by time points (baseline, 6-months, and 12-months).

		Distressed Group		Ashamed Group		Flexible Group		ANOVA Sign.	Total	
Time	Variables	M	SD	M	SD	M	SD	p	M	SD
Baseline	SCL Total	1.88	0.63	1.54	0.71	1.74	0.64	.354	1.76	0.65
	SCL-Host.	1.69	.97	1.17	.85	1.49	0.95	.303	1.52	0.94
	BSL	2.46	0.77	2.24	0.93	2.06	0.77	.248	2.29	0.77
	IIP Total	132.31	36.35	109.0	19.10	120.88	28.14	.053†	123.96	31.86
	IIP NA	20.12	8.41	17.27	3.98	18.59	5.30	.487	19.06	6.79
	IIP OA	17.85	6.63	13.45	4.87	15.00	5.16	.087	16.06	6.05
	IIP SS	18.77	7.58	17.27	3.50	18.77	7.58	.353†	17.43	6.75
	IIP SI	19.69	7.41	18.55	4.82	17.59	6.26	.592	18.80	6.55
	DERS Total	137.88	13.67	130.27	17.33	130.18	17.82	.224	133.83	16.02
	DERS-AW	18.92	4.35	18.82	5.38	16.41	4.06	.179	18.11	4.55
	KIMS Total	101.35	11.70	103.09	12.12	106.71	18.84	.494	103.39	14.32
	KIMS-Obs	35.54	8.99	32.55	8.85	40.76	8.87	.050*	36.57	9.29
	STAXI Trait	30.85	5.69	22.45	5.96	29.82	4.69	<.001*	28.81	6.27

	STAXI AT	12.58	2.87	9.00	2.65	11.82	2.90	.004*	11.61	3.11
	STAXI AR	13.08	2.94	9.36	2.66	12.53	1.88	.003†*	12.15	2.92
	STAXI EO	21.96	4.61	18.09	5.09	22.53	4.78	.044*	21.35	4.97
	STAXI EI	23.88	3.70	20.09	3.70	23.29	5.01	.044*	22.93	4.33
6-Months	SCL Total	1.84	0.76	1.46	0.62	1.62	0.70	.315	1.69	0.72
	SCL-Host.	1.62	1.00	0.86	0.58	1.13	0.66	.026†*	1.31	0.88
	BSL	2.17	0.85	2.03	0.82	1.96	0.98	.748	2.08	0.87
	IIP Total	123.35	29.24	100.09	29.01	97.41	35.60	.019*	110.44	33.21
	IIP NA	20.73	6.25	17.18	6.63	15.00	6.96	.022*	18.20	6.93
	IIP OA	17.46	5.41	13.55	6.41	12.47	6.08	.020*	15.09	6.18
	IIP SS	18.04	5.76	14.55	6.49	13.06	6.69	.035*	15.76	6.50
	IIP SI	18.96	6.63	17.73	4.78	14.47	6.54	.080	17.03	6.47
	DERS Total	120.69	24.15	115.18	21.77	107.41	24.00	.208	115.39	23.93
	DERS-AW	18.23	4.69	18.36	4.41	15.71	3.92	.149	17.46	4.49
	KIMS Total	104.85	15.28	107.73	11.15	116.41	18.00	.063	109.07	16.06
	KIMS-Obs	37.35	7.32	34.64	8.62	40.24	7.37	.165	37.70	7.73
	STAXI Trait	28.92	6.58	21.91	5.80	27.94	6.14	.011*	27.19	6.76
	STAXI AT	11.15	3.36	8.82	3.16	10.71	3.57	.164	10.54	3.44
	STAXI AR	12.58	2.63	9.55	2.25	12.12	2.18	.004*	11.81	2.65
	STAXI EO	20.31	5.09	16.36	4.18	20.18	5.22	.077	19.46	5.12
	STAXI EI	22.96	3.57	19.73	3.55	21.76	3.80	.055	21.93	3.78

12-Months	SCL Total	1.53	0.84	1.47	0.88	1.12	0.74	.309	1.40	0.82
	SCL-Host.	1.08	0.82	1.18	0.98	0.58	0.81	.128	0.96	0.87
	BSL	1.68	1.02	1.78	0.98	1.45	0.98	.662	1.64	0.99
	IIP Total	112.81	44.31	106.45	32.70	85.60	39.31	.127	103.62	41.67
	IIP NA	18.85	8.06	18.45	7.44	13.07	6.78	.060	17.10	7.88
	IIP OA	15.96	7.00	14.36	6.82	11.33	6.49	.123	14.28	6.98
	IIP SS	15.46	7.85	14.73	5.61	11.80	5.47	.254	14.25	6.86
	IIP SI	18.23	8.21	19.82	5.49	12.47	7.71	.030*	16.90	7.99
	DERS Total	106.19	31.89	108.45	26.48	91.93	23.33	.238	102.56	28.86
	DERS-AW	16.35	5.28	17.18	3.09	13.07	3.77	.041*	15.58	4.70
	KIMS Total	112.54	22.63	112.73	15.98	124.07	20.74	.210	115.90	21.14
	KIMS-Obs	40.31	9.63	36.82	7.39	42.27	8.25	.304	40.13	8.87
	STAXI Trait	25.69	6.77	22.00	8.30	23.93	6.35	.333	24.40	7.01
	STAXI AT	10.27	3.24	9.00	3.77	9.07	3.60	.444	9.65	3.45
	STAXI AR	11.38	3.09	9.18	2.96	11.00	2.51	.114	10.81	2.98
	STAXI EO	19.50	4.52	16.64	4.88	17.07	4.46	.128	18.19	4.68
	STAXI EI	23.12	3.70	20.45	2.70	20.33	5.08	.044†*	21.75	4.14

SCL-90-R Total (Subscale: Hostility); BSL Mean Score; IIP-64 Total (Subscales: Non-Assertive, Overly Accommodating, Self-Sacrificing, Socially Inhibited); DERS Total (Subscale: Awareness); KIMS Total (Subscale: Observe); STAXI Total Trait Anger (Subscales: Angry Temperament, Angry Reaction, Anger Expression Out, Anger Expression In).
*p-value is below .05.
† p-value of Welch statistic.

VITA AUCTORIS

Florencia Cristoffanini was born on January 21st, 1993, in Concepcion, Chile. She graduated from Pinetree Secondary School in 2011. From there, she went on to obtain an Associate of Arts degree from Douglas College in 2014 and a B.A. (Hons) degree in Psychology from Simon Fraser University in 2020. She is currently a candidate for the Master's degree in Psychology at the University of Windsor and will graduate in the Fall 2023. She plans to continue onto her PhD in Clinical Psychology.