Published in final edited form as:

Curr Opin Psychol. 2015 April 1; 2: 75–81. doi:10.1016/j.copsyc.2014.12.028.

The Promise of Third-Wave Behavioral Therapies in the Treatment of Substance Use Disorders

Angela L. Stotts, Ph.D.^{1,2} and Thomas F. Northrup, Ph.D.¹

¹Department of Family & Community Medicine, University of Texas Medical School at Houston

²Department of Psychiatry and Behavioral Sciences, University of Texas Medical School at Houston

Abstract

Substance use disorders are common and frequently complex, with overlapping medical, legal, social and psychiatric problems. Innovative treatment models to address the full range of problems in new ways using common principles are needed. Third wave behavior therapies such as Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy (DBT) comprise novel approaches and methods that have great potential to address complex substance abuse cases. These treatment models derive from contextual and behavioral science and have a common emphasis on developing empirical, principle-driven methods for approaching unwanted or distressing psychological and physical experiences common to substance use and other disorders. Randomized controlled trials targeting substance use with ACT and DBT have been conducted across varying populations, including various target substances (opiates, methamphetamine, polysubstance) and settings (prisons, methadone clinics, residential treatment, and outpatient). Despite methodological heterogeneity, ACT and DBT have compared favorably to passive and active control conditions. Further research is needed, however, with larger samples and active control conditions, along with studies of treatment mechanisms, to inform and shape theoretical models and substance abuse treatment protocols for enhanced efficacy.

Substance use disorders (SUDs) are highly prevalent. The 2012 Substance Abuse and Mental Health Services Administration survey estimated that 22.2 million persons aged 12 or older (8.5 percent) were classified with substance dependence or abuse in the past year based on criteria specified in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition [1]. Co-morbid conditions, particularly psychiatric disorders and social problems (e.g., poverty, homelessness), commonly co-occur with SUDs and increase the complexity of the disorder and the treatment. Innovative treatment models to address the myriad problems facing individuals with alcohol, drug and other addictions are sorely needed.

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Third Wave Contextual Behavior Therapies and Substance Use Disorders

Third wave behavior therapies such as Acceptance and Commitment Therapy (ACT) and Dialectical Behavior Therapy (DBT) hold great promise for addressing complex SUDs. These “contextual cognitive behavioral therapies” have a common emphasis on developing empirical, principle-driven methods for approaching unwanted or distressing psychological and physical experiences [2, 3, 4]. The primary difference from previous cognitive behavioral therapies (CBTs) is the emphasis placed on the context and function of these unpleasant internal events and not on the content itself. In these models thoughts are not presumed to be causal. Thus, rather than changing verbal content, the context in which thoughts, feelings and physical sensations occur is manipulated to change the function of these unwanted experiences. Processes common to contextual CBTs include acceptance, mindfulness, and values, briefly described below as they apply to substance use disorders.

Individuals abusing substances experience numerous unpleasant thoughts (e.g., I’m a failure, I need a drink), feelings (e.g., depression, anxiety), and physical sensations (e.g., drug withdrawal) that are both precipitants and consequences of substance use. Substance use and other addictive behaviors often serve to avoid or control these internal experiences and the discomfort associated with them. Distressing precipitants and the inevitable negative consequences of drug use often lead to a continuous cycle of experiential avoidance [5], i.e., repeated attempts to alter the form, frequency, or intensity of private experiences such as thoughts, feelings, physical sensations, and memories, even when doing so is costly or ineffective [4, 6]. Thus, an overarching goal of contextual CBTs is to identify and experience alternative ways in which to relate to these unpleasant private events (e.g., acceptance, emotion regulation), which will disrupt the seemingly causal link between psychological/physical distress and drinking/drug use behavior. For example, acceptance skills are used to facilitate increased willingness to live with distressing events and persist in distressing tasks, and emotion regulation strategies can be used to increase emotional awareness and reduce vulnerability to overwhelming emotions [4, 7]. Acceptance and emotion regulation strategies are introduced via experiential exercises and metaphors in which conscious attention is directed to the psychological distress in a non-judgmental, compassionate, or sometimes silly or absurd manner. Such change in the context alters the function of distressing thoughts and feelings, allowing for alternative behaviors to drug use.

Clients with SUDs are often **unaware** of the precipitants or triggers of drug use, as well as fail to notice negative consequences of their addiction and related behaviors [8]. It is challenging to change often impulsive substance use behavior without this awareness, and thus most third wave, contextual CBTs introduce mindfulness-based practices (attending to the here-and-now). Mindfulness interventions increase awareness of natural environmental contingencies and assist substance abusers in noticing triggers and consequences in a flexible and non-reactive manner. Ideally, in this new and mindful context clients are able to make decisions and choices based on important personal goals and values rather than on avoidance or control through substance use. For example, mindfully and flexibly observing the urge to use in a social situation may allow for the identification and implementation of alternative behaviors to substance use. Broadening response repertoires in the face of distressing experiences is paramount.

Finally, rather than exclusively focusing on the reduction/elimination of addictive behaviors, contextual CBTs place significant emphasis on living a valued and meaningful life. This juxtaposition of avoidance behavior and values creates dissonance from which motivation can build and valued action can take hold. Identifying values dignifies the inevitable suffering involved in abandoning a well-established behavior that served as an escape from distress and the consequences of addiction [8]. Many SUD clients have long forsaken family, social relationships, and careers, making the reestablishment of valued directions a challenging yet highly important step in the process of change.

Randomized controlled trials (RCT) of ACT and DBT for substance use disorders will be reviewed, representing two of the primary third wave CBTs. Each contains common identified elements (i.e., acceptance, mindfulness, values) to varying degrees while also possessing additional elements unique to each treatment model. Table 1 provides supplementary details regarding the primary RCTs targeting substance use disorders with ACT and DBT.

Acceptance and Commitment Therapy for Substance Use Disorders

Traditional Cognitive Behavioral Therapy (CBT), including Relapse Prevention and Contingency Management, has been the dominant empirically-based treatment approach to addiction for 30+ years. ACT has been evolving over that time and is emerging as an alternative, having been recently listed as an evidence-based treatment by the Substance Abuse and Mental Health Services Administration (SAMSHA) [9]. The first substance abuse treatment study was conducted by Hayes and colleagues [10] with polysubstance-abusing opioid addicts enrolled in a methadone clinic. ACT was compared to a time-matched active treatment, Intensive Twelve Step Facilitation (ITSF), and care-as-usual in the methadone clinic (methadone maintenance only: MMO). At the follow-up assessment both ACT and ITSF were associated with less objectively-verified drug use relative to MMO, and 23% fewer ACT group participants reported drug use relative to the ITSF. A similar randomized, controlled trial (RCT) with methamphetamine users failed to find differences between ACT and CBT (N = 104), however, only a third of the sample was available at the post-treatment assessment [11].

Two smaller RCTs, targeting drug abuse in incarcerated women and opioid use in patients seeking outpatient methadone detoxification favored ACT [12, 13]. Specifically, drug-using, incarcerated women who received 16 weekly ACT group sessions demonstrated significant reductions in drug use from pre- to post-treatment and across the 18-month follow-up period [12, 14]. Similarly, opioid dependent patients who underwent a 24-week dose reduction program with 24 weekly individual ACT sessions were nearly twice as likely to be opioid free (36.7%) at the end-of-treatment relative to an equally intensive, active drug counseling treatment (19.2%)[13].

Finally, the strongest evidence to date in a more general substance abusing population yields from a trial using ACT to target shame and stigma among clients in a residential treatment facility [15], compared to a treatment-as-usual control condition. The treatment was less intensive relative to previous ACT research treatments, consisting of three 2-hour groups in

a one-week period. In the 13 weeks following discharge from the facility, ACT participants were more than twice as likely to be abstinent during any week, utilized drug/alcohol treatment services at higher rates, and reported less internalized shame at follow-up relative to participants who received treatment-as-usual. Shame related to the stigma of substance abuse is a common experience and based on Luoma et al. [15] is an important treatment target for ACT approaches with these populations.

Based on the RCTs described and additional studies involving single subject designs [16], case studies [17, 18], studies targeting comorbid populations [19], professional burnout in substance abuse counselors [20], and smoking cessation (addressed elsewhere in this special edition), ACT as a treatment for substance abuse is highly promising. As shown in Table 1, effect size estimates generally favored ACT for drug abstinence at the end-of-treatment (EOT), and persisted at later follow-up visits. The largest effects at EOT or follow-up came from comparisons of ACT to treatment-as-usual (TAU), drug counseling, or methadone maintenance (relative risk [RR] range: 1.58-4.17; odds ratio [OR] = 2.32). Comparisons of ACT to CBT or intensive 12-step facilitation (ITSF) still generally favored ACT (RR range: 0.64-1.76), with the exception of Smout et al. [11]. Notably, while most of the confidence intervals for these effect sizes included 1.0 (indicating a lack of statistical significance), these initial studies of ACT targeting substance use disorders provide critical effect size estimates for future work. Larger, controlled studies with broader substance use populations are needed, however, to strengthen claims of efficacy, particularly relative to alternative, active treatments.

Importantly, the newer contextual behavioral therapies are placing significant emphasis on understanding the processes by which treatment is or is not successful. The ACT model proposes the overarching construct of psychological flexibility as well as several key processes that need further study as potential mechanisms of treatment, (i.e. acceptance, defusion, self-as-context, mindfulness, values, and committed action). Disorder-specific mechanisms, such as substance abuse stigma or shame, also need further research confirming their importance as treatment targets. To date investigations of ACT mechanisms in substance use populations is limited, although avoidance/inflexibility and acceptance have been evaluated in a few treatment or laboratory studies. For example, Stotts et al. [13] noted during methadone detoxification a differential decrease on an Avoidance and Inflexibility measure [21], tailored to opioid withdrawal, for the ACT group relative to an active Drug Counseling control group. In a secondary data analysis of a contingency management (CM) intervention, cocaine abusers who were non-responsive to the CM intervention had significantly higher baseline levels of avoidance and behavioral inflexibility in the context of distressing cocaine-related thoughts, feelings and physical sensations [22], suggesting ACT in combination with CM to enhance effects for cocaine use disorder. Also, as mentioned previously, Luoma et al. [15] successfully targeted acceptance and flexibility around feelings of shame and stigma using an ACT intervention. Finally, a laboratory study found that mindful experiential acceptance weakened the relation between automatic urges to drink alcohol and hazardous drinking [23]. Larger studies of mediational models are needed to inform ACT treatments for substance-abusing populations.

Dialectical Behavior Therapy (DBT)

DBT has been adapted specifically for substance use disorders (DBT-SUD); however, its efficacy for treating SUDs has been examined mostly with women with co-morbid borderline personality disorder (BPD). DBT-SUD is highly similar to standard DBT (e.g., weekly individual and group skills sessions, with phone coaching) and includes substance abuse-specific skills (e.g., “cope ahead” to plan for relapses) and other strategies to increase client engagement and participation. Further, DBT-SUD emphasizes immediate and permanent drug cessation (change) while addressing the realities of relapse and necessity for harm reduction (acceptance) through non-judgmental problem-solving [see Chapter 2; 5]. The seminal RCT targeting the application of DBT-SUD recruited polysubstance-dependent individuals with co-morbid BPD. DBT participants, compared to community TAU participants, had better retention (64% vs. 27%) and significant reductions in drug use [24]. This finding, along with promising results from a study with 3 methamphetamine-dependent women with BPD [25], supported a follow-up study of DBT-SUD with opiate-dependent BPD participants, compared to a more rigorous control. Both groups reduced substance use, although the control condition had better retention (64% vs. 100%) [26]. A third (multi-site) RCT included both men and women who were opiate dependent and buprenorphine/naloxone eligible; currently this work is pending publication [as discussed by Dimeff & Sayrs in Hayes & Levin, 2012; 5]. Preliminary results show that both DBT-SUD and an active control condition [i.e., individual and group drug counseling; 27] were equally effective for reducing drug use, although DBT-SUD may be more effective for reducing drug use long-term. Longer term benefits of DBT-SUD were also suggested by Linehan et al. [26], demonstrating decreased drug use for DBT-SUD patients in the last 4 months of treatment.

Research has demonstrated feasibility and acceptability of the adaptation of DBT-SUD from standard DBT, and DBT-SUD is expanding to new modalities. For example, a DBT smartphone application (“DBT Coach”) was tested with a group of 22 individuals enrolled in DBT for BPD with concomitant substance use. The application coached participants in the use of “opposite action” (i.e., changing an unwanted emotional state by behaving in a way to counter the emotion’s action urge [e.g., walking away when angry rather than yelling or fighting]). The study demonstrated feasibility of the technological intervention and resulted in significant decreases in urges and emotion intensity [28].

To date, DBT-SUD has been applied to limited populations (i.e., women with co-morbid BPD, excepting the most recent study that included men) and generalizability to a more heterogeneous SUD population is unknown. Effect sizes for one DBT-SUD study were small to medium in size for drug abstinence at EOT and follow-up (**Cohen’s d** range: 0.24-0.75), favoring DBT-SUD over TAU [24]; however, a more recent trial of DBT-SUD compared to a more active control (i.e., comprehensive validation therapy plus 12-step) was less promising (**RR**=1.09 at follow-up) [26]. Studies of primary treatment mechanisms targeted by DBT (e.g., emotion regulation) are just beginning. For example, Axelrod and colleagues in a recent uncontrolled trial of 27 women with co-morbid substance dependence and BPD demonstrated a relationship between improved emotion regulation and decreased substance use [29]. DBT-SUD protocols to date, however, may be more extensive than some

substance users require, as the two published RCTs are one year in length with weekly sessions. SUD clients for whom emotion dysregulation plays a small role in continued drug use are unlikely to need a treatment of this intensity. Overall, however, DBT-SUD has partial early support for treating substance use disorders for women with comorbid BPD and may hold promise in the treatment of other substance-abusing populations.

Conclusions and Future Directions

While research on third wave behavioral therapies for SUDs is still accruing, preliminary evidence indicates promise. In addition to larger, adequately powered outcome studies, studies of theoretically-derived processes underlying change are critical in order to identify and understand precise mechanisms responsible for behavior change. This knowledge will allow third wave therapies to adapt and evolve over time, with increasing efficacy. The emphasis on transdiagnostic models will facilitate the rate of discovery as important mechanisms of change identified in one population are likely important in others. Given the chronic, relapsing nature of substance use disorders, novel treatment modalities to deliver or augment ACT and DBT are also being explored, such as texting [30], mobile phone/computer applications [28], and computer/web-based programs [31]. Again, identifying key treatment mechanisms, as well as valid measures for such (e.g., Acceptance and Action Questionnaire-Substance Abuse) [32], is vital to successfully adapting treatments to such technological formats. The third wave strategies have breathed new life into what was an increasingly stagnant substance abuse treatment field. Mindfulness and acceptance strategies with substance abusing clients have uniformly been met with high enthusiasm [e.g., 30], and provide innovation in the pursuit of effective treatments to address complex and enduring problems of addiction.

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1. Positive treatment effects have been found for ACT and DBT with substance abusers.
2. Significant emphasis is placed on understanding treatment mechanisms for ACT and DBT.
3. Additional research with larger samples and active control groups is needed.

Table 1
Study Characteristics and Results for RCTs of ACT and DBT-SUD Targeting Substance Use Disorders

Reference	N	Sample Characteristics			ACT/ DBT (n)	Control Group (n)	Total Tx Sessions & EOT Sample (n)	Outcome Measure	End-of-Treatment (EOT)		Follow-Up Up Time Point (n)	Follow-Up	
		a. Recruitment Setting	b. Sample	c. Gender (% Female)					% Abstinent	Effect Size: <i>RR</i> (95% CI)		% Abstinent	Effect Size: <i>RR</i> (95% CI)
Hayes et al. (2004)	124	a.	Methodone clinic		ACT (n=42)	ITSF (n=44) MM (n=38)	48 ind. & group sessions across 16 weeks (n=73)	UA for opiates and for any drug (% negative)	Opiates MM: 35.7% ITSF: 54.5% ACT: 56.5% Any Drug MM: 32.1% ITSF: 50.0% ACT: 52.2%	Opiates ITSF: 1.04 ^A (0.61-1.75) MM: 1.58 ^A (0.86-2.92) Any Drug ITSF: 1.04 ^A (0.59-1.85) MM: 1.62 ^A (0.83-3.16)	6 months (n=69)	Opiates MM: 28.0% [*] † ITSF: 50.0% ACT: 61.1% Any Drug MM: 12.0% [*] † ITSF: 38.5% ACT: 50.0%	Opiates ITSF: 1.22 ^A (0.72-2.08) MM: 2.18 ^{*A} (1.05-4.52) Any Drug ITSF: 1.3 ^A (0.66-2.54) MM: 4.17 ^{*A} (1.31-13.26)
Villagrà et al. (2014) & González- Menéndez et al. (2014)	50	a.	Women's prison (Spain)		ACT (n=18)	Waitlist TAU (n=13) CBT (n=19)	16 weekly group sessions (n=50)	Previous 3- month drug use (self-report; random UAs) for any drug (% abstinent)	TAU: 7.7% [*] CBT: 15.8% ACT: 27.8%	TAU: 3.61 ^A (0.48-27.4) CBT: 1.76 ^A (0.49-6.31)	6M (n=41) 12M^B (n=24) 18M^B (n=24)	6M TAU: 18.2% [*] CBT: 25.0% ACT: 42.8% 12M^B CBT: 54.5% ACT: 84.6% 18M^B CBT: 50.0% [*] ACT: 85.7%	6M TAU: 2.36 ^A (0.59-9.48) CBT: 1.71 ^A (0.60-4.86) 12M^B CBT: 1.55 ^A (0.86-2.79) 18M^B CBT: 1.71 ^A (0.89-3.30)
Luoma et al. (2012)	133	a.	28-day residential treatment		ACT (n=68)	TAU (n=65)	3 group sessions in 1 week (n=113)	Previous 13- week drug and alcohol use (on TLFB) (% abstinent)	N/A ^C	N/A ^C	4 months (n=79)	NR ^C	OR=2.32 [*] (1.14-4.74)
Smout et al. (2010)	104	a.	Outpatient and inpatient (Australia)		ACT (n=51)	CBT (n=53)	12 weekly ind. sessions (n=26)	Previous 30-day hair analysis for meth and other drugs (% negative)	Meth CBT: 42.9% ACT: 33.3% Other Drugs CBT: 78.6% ACT: 50.0%	Meth 0.78 ^A (0.29-2.12) Other Drugs 0.64 ^A (0.34-1.19)	3 months (n=19)	Meth CBT: 36.3% ACT: 50.0% Other Drugs CBT: 63.6% ACT: 50.0%	Meth 1.38 ^A (0.48-3.91) Other Drugs 0.79 ^A (0.34-1.79)
Stotts et al. (2012)	56	a.	Outpatient methadone detoxification		ACT (n=30)	Drug Counseling (DC; n=26)	24 weekly ind. sessions (n=30)	UA for opiates (% negative)	DC: 19.2% ACT: 36.7%	1.91 (0.76-4.77)	NR	NR	NR

Reference	N	Sample Characteristics				ACT/ DBT (n)	Control Group (n)	Total Tx Sessions & EOT Sample (n)	Outcome Measure	End-of-Treatment (EOT)		Follow-Up		
		a. Recruitment Setting	b. Sample	c. Gender (% Female)	% Abstinent					Effect Size: <i>RR</i> (95% CI)	Follow- Up Time Point (n)	% Abstinent	Effect Size: <i>RR</i> (95% CI)	
Linehan et al. ^D (1999)	28	a.	Outpatient			104 ind. & group sessions across 1 year (n=18)	UA for any drug (Mean % negative)	PP TAU: 33.0% [^] DBT: 57.0% ITT TAU: 23.0% DBT: 35.0%	PP <i>d</i> =0.63 ITT <i>d</i> =0.24	4 months (n=18)	PP TAU: 18.0% [*] DBT: 50.0% ITT TAU: 13.0% [^] DBT: 29.0%	PP <i>d</i> =0.75 ITT <i>d</i> =0.56		
Linehan et al. ^E (2002)	23	a.	Outpatient			104 ind. & group sessions across 1 year (n=20)	UA for opiates (Mean % negative)	CVT: 53.3% DBT: 46.4%	NC	4 months (n=19)	CVT: 67% ^F DBT: 73%	1.09 ^A (0.64-1.87)		

Note. All effect size estimates are relative risk ratios, unless otherwise indicated. Effect sizes in published studies were used if reported; otherwise, MedCalc statistical software (freely available at: http://www.medcalc.org/calc/relative_risk.php) was used to calculate the relative risk (RR) of being abstinent based on the raw data reported for completed study visits. All RR ratios are expressed with the control condition as the reference group and values >1.0 favor the ACT or DBT-SUD condition. If both self-report (i.e., TLFB) and objective (urine or hair) data were reported; we chose to report objective data. An asterisk () by raw data percentages for a study indicates that the authors reported a significant difference compared to the ACT or DBT-SUD condition in their primary analysis. “ab/dep” = abuse/dependence; “BPD” = Borderline Personality Disorder; “CBT” = Cognitive Behavioral Therapy; “CVT+12S” = Comprehensive Validation Therapy + 12-step ; “d” = Cohen’s d; “EOT” = end-of-treatment; “ind.” = Individual; “ITSF” = Intensive 12-step facilitation; “ITT” = intention-to-treat; “M” = Months; “Meth” = Methamphetamine; “MM” = Methadone maintenance; “N/A” = Not applicable; “NC” = Not reported; “NR” = Not reported; “OR” = Odds Ratio; “PP” = Per protocol; “SUD” = Substance use disorder; “TAU” = Treatment-as-usual; “TLFB” = Alcohol and Drug Timeline Follow-Back Interviews; “Tx” = Treatment; “UA” = Urinalysis.

^A Our RR calculations are indicated by an.

^B The long-term follow-up data reported in González-Menéndez et al. (2014) did not include data for the waitlist control group at 12 and 18 months.

^C Luoma et al. (2012) did not measure substance use at the end-of-treatment because the study was conducted within a 28-day residential treatment setting.

^D Linehan et al. (1999) reported raw data for the “treated” (per protocol[PP]) and ITT samples at several intervals; we chose the “year total” time point (representing the entire length of the treatment period).

^E Linehan et al. (2002) provided many outcomes that were difficult to summarize; we chose to report urinalyses for heroin, the primary substance of abuse. The follow-up data is based on the percentage opiate negative from a single urinalysis.

^{*} *p* 0.05

[^] *p*<0.10

[†] ITT was not significant

[‡] ITT analysis was marginally significant at *p*=0.09