Case Formulation-driven Cognitive Behavior Therapy

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This chapter describes a case formulation-driven approach to cognitive behavior therapy (CBT). The chapter begins with an overview of the model of case formulation-driven CBT, and a brief review of its empirical underpinnings. We describe each element of the model, illustrating our points with the case of "Alexa," who was treated by the second and third authors when they were graduate students in the UC Berkeley Doctoral Clinical Science Training Program. The second author (C.L.B.) was supervised by the first author (J.B.P.). We conclude with a brief discussion of our recommendations for future directions of research and practice relating to case formulation.

Case Formulation-driven Cognitive Behavior Therapy

The model of case formulation-driven CBT appears in Figure 1 (see also Persons (2008)). As shown in the figure, the therapist begins the process of case formulation-driven CBT by carrying out an assessment to collect the information needed to obtain a diagnosis and develop an initial formulation of the case. The diagnosis and formulation help the therapist identify treatment targets and develop an initial treatment plan. After obtaining informed consent for treatment, the therapist moves forward with treatment. Throughout treatment, the therapist uses data collected through client feedback and progress monitoring to test formulation hypotheses and to evaluate whether the treatment is helping the patient accomplish his or her goals. The therapist can often use the formulation to help understand and intervene to address problems that arise in the therapy and impede progress, such as homework noncompliance or low motivation to change. As the figure illustrates, a review of the progress monitoring data helps the patient and therapist determine when it is appropriate to terminate treatment.

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Empirical Underpinnings of Case Formulation-driven Cognitive Behavior Therapy

Evidence from a handful of randomized controlled trials and uncontrolled naturalistic outcome studies, and from a large number of single case studies, suggests that CBT guided by an individualized case formulation, produces outcomes that are equal or superior to outcomes of

treatment guided by a standard protocol (see reviews by Haynes, Leisen, & Blaine, 1997; Nelson-Gray, 2003; Persons and Hong, 2016).

Another type of evidence underpinning the case formulation approach is the evidence underpinning the empirically-supported treatments (ESTs). ESTs refer to psychological treatments for specific populations or disorders that have been shown to be effective in randomized controlled trials. To the degree that a clinician draws from one or more EST protocols when developing an individualized formulation and treatment plan, the scientific evidence base supporting the ESTs also provides some empirical underpinning for a case formulation-driven treatment. Moreover, the approach to treatment we describe here can be seen as a systematic strategy for individualizing the EST, similar to the individualization that inevitably occurs when a skilled therapist implements an EST (Kendall, Chu, Gifford, Hayes, & Nauta, 1998).

The therapist using a case formulation-driven approach to treatment also relies on more general (that is, not disorder-specific or symptom-specific) evidence-based psychological theories (e.g., operant conditioning), and findings from basic psychological science (e.g., that suppression of emotions produces physiological arousal and intrusions [Gross & Levenson, 1993; Wenzlaff and Wegner, 2000]). The therapist also relies on evidence-based assessment tools and strategies (see Hunsley & Allan, this volume; Hunsley and Mash (2018)), and on interventions, such as progress monitoring, that have been shown to contribute to improved treatment outcome (e.g., Lambert, Harmon, Slade, Whipple, & Hawkins, 2005).

Another empirical feature of the formulation-driven approach to CBT is the use of a hypothesis-testing approach to the treatment of each case. The therapist using a case formulation approach to treatment develops a hypothesis (formulation) about the psychological mechanisms that cause and maintain the patient's symptoms. The therapist then uses the hypothesis to design an intervention plan, collects data to evaluate the patient's response to the interventions that flow out of the formulation, and revises the treatment as needed based on these data. Thus, the therapist using a case formulation-driven approach to treatment relies on the scientific method.

Assessment to Obtain a Diagnosis and Case Formulation

As shown in Figure 1, before treatment begins, the therapist collects assessment data in order to develop a diagnosis and an initial case formulation.

Diagnosis

Why diagnose? Even the clinician whose treatment is guided by a case formulation (rather than by an EST that targets a diagnosis) will want to obtain a diagnosis for each patient for at least three reasons. First, much of the psychopathology, epidemiology, and treatment efficacy literatures are organized by diagnosis. The clinician who is providing evidence-based care will want to draw on these literatures. Second, the diagnosis helps the therapist develop a formulation of the case. All cognitive-behavioral ESTs are based on a nomothetic formulation of the disorder treated by the EST. For example, CBT for panic disorder is founded on the formulation that panic symptoms result from catastrophic interpretations of benign somatic

sensations (Barlow & Cerny, 1988). The clinician who is developing a formulation for a patient who has panic disorder will want to consider basing his or her idiographic formulation on this evidence-based nomothetic formulation. Third, as we describe later, we view the therapist's provision of information to the patient about his or her diagnosis as an essential element of obtaining informed consent for treatment. For these reasons, we encourage the clinician to obtain a valid diagnosis.

The case formulation

A case formulation describes the patient's *symptoms, disorders,* and *problems*, and proposes *mechanisms* causing the problems, *precipitants* of the problems, and *origins* of the mechanisms. The formulation ties these elements together into a coherent whole.

Disorders and problems. The case formulation accounts for all of the disorders and problems a patient is experiencing. To obtain a comprehensive problem list, the therapist assesses the following domains: psychiatric symptoms, interpersonal, occupational, school, medical, financial, housing, legal, and leisure problems, as well as difficulties with mental health or medical treatment. Note the overlap of the problem list with the diagnosis. If the patient meets criteria for one or more psychiatric disorders, these disorders (or their symptoms) belong on the problem list. However, the problem list is more comprehensive than the psychiatric disorders, and also identifies the difficulties in functioning that cause and/or result from the disorders, as well as other difficulties (e.g., medical problems) the patient is experiencing.

Obtaining a comprehensive list of problems is critical. Important problems can be missed if the therapist simply focuses on the problems that are in plain view or that the patient wants to address. For example, it is not unusual for a patient to minimize a significant substance abuse problem that is not only harmful in itself but is also likely to impede or prevent successful treatment of the problems the patient *does* want to focus on. A comprehensive problem list often reveals common elements or themes that cut across various problems. Awareness of these themes helps the therapist generate mechanism hypotheses for the formulation. Problems that may seem irrelevant to the psychotherapy (e.g., medical problems that impede the patient's mobility) can affect other problems (e.g., can contribute to low mood if physical activity is an important source of pleasure for the patient) or the patient's ability to carry out the treatment, and therefore should also be included in the problem list.

To obtain a diagnosis and comprehensive problem list, the clinician can rely on the clinical interview, information from family members and other clinicians who have treated the patient, standardized interviews, such as diagnostic interviews, and on standardized scales and idiographic logs (e.g., a log of panic attacks) (Woody, Detweiler-Bedell, Teachman, & O'Hearn, 2003).

Mechanisms. The heart of the case formulation is a description of psychological mechanisms that cause and maintain the patient's problems and symptoms. The formulation might also include biological mechanisms, but we focus here on psychological mechanisms. Cognitive behavioral therapists base their formulations on mechanisms that involve dysfunctional cognitive contents (e.g., beliefs and automatic thoughts), dysfunctional cognitive

processes (e.g., problems with attentional biases or repetitive negative thinking), problematic contingencies (e.g., family members who reward the patient's maladaptive behaviors), problems with emotion regulation, skills deficits, and conditioned emotional reactions (Koerner, 2012). The Research Domain Criteria (RDoc) (https://www.nimh.nih.gov/research-priorities/rdoc/constructs/rdoc-matrix.shtml) provide a rich source of mechanism hypotheses, as does the literature surrounding the ESTs.

The clinician strives to develop a formulation that identifies a few mechanisms that appear to cause and maintain the patient's main problems, and tailors treatment to modify those mechanisms. Identifying a small number of mechanisms that can be treatment targets is especially helpful when patients have multiple comorbidities; the hope is that targeting a few mechanisms can address all comorbidities.

Precipitants. The cognitive-behavioral formulation is typically a *diathesis-stress* hypothesis; that is, it describes how mechanisms (*diatheses*) interact with *stressors* to cause and/ or maintain symptoms and problems. Stressors can be external events (e.g., the death of a parent) or internal factors (e.g., an endocrine disorder). Information about stressors can contribute to mechanism hypotheses. For example, the information that the patient's depression was precipitated by a relationship breakup suggests that the patient may hold a self-schema such as, "I'm unlovable." To identify precipitants, the therapist can work with the patient to develop a timeline indicating when symptoms developed or worsened and the events in the person's life occurring around times that symptoms changed.

Origins of the Mechanisms. The "origins" are the events that led the patient to acquire the mechanisms described in the formulation, e.g., to learn faulty beliefs or problematic behaviors. Information and hypotheses about origins can be quite validating to the patient, and can point to interventions (e.g., see Young, 1999). For most clinicians, the major source of information about origins is a clinical interview focused on the patient's early upbringing and experiences.

Tying All the Elements Together. The case formulation describes what *origins* led to the development of what *mechanisms*, which cause and maintain the patient's *symptoms, disorders,* and *problems* activated by what *precipitants*. We recommend laying out the *problems* and *mechanisms* elements of the formulation in a drawing (see Figure 2) that the therapist can collaboratively develop with the client. The client and therapist can use the formulation diagram to guide the therapy, and modify it as they acquire new information during the process of treatment.

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Case example: Assessment to develop a diagnosis and case formulation

Problem List and Diagnosis

"Alexa" was a 19-year-old Caucasian woman who called the UC Berkeley Psychology Clinic, the training clinic for the Clinical Science Program at the university, saying, "I need help.

I am a complete wreck." She was attending classes at a local community college, living in an apartment with several roommates who were also students, and working part-time at a donut shop. A brief telephone screening interview suggested that her difficulties and distress were of a level of acuity that could be safely and effectively treated in the training clinic setting, and Alexa was invited to come in to the clinic for an initial consultation session to determine whether treatment in the clinic might be helpful to her.

To aid in the process of developing a diagnosis and formulation, the therapist (C.L.B.) asked Alexa to arrive 30 minutes early for the initial session to complete intake paperwork, including several self-report assessment scales. The therapist included several measures in Alexa's intake packet that she typically assigns to clients she evaluates: the Beck Depression Inventory II (BDI; Beck, Steer, & Brown, 1996), the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988), the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995), and the Obsessive Beliefs Questionnaire (OBQ-44; Obsessive Compulsive Cognitions Working Group, 2005), a self-report diagnostic screening tool.

Although not a diagnostic tool, the BDI-II (Beck et al., 1996) is especially useful because it assesses symptoms of depression over the two-week time span required in the DSM for an episode of major depressive disorder. The DASS (Lovibond & Lovibond, 1995; Brown, Chorpita, Korotitsch, & Barlow, 1997) is a self-report measure with three subscales assessing symptoms of depression (low positive affect, e.g., "felt downhearted and blue,"), anxiety (panic and physiological arousal, e.g., "felt I was close to panic"), and stress (high negative affect, e.g., "hard to wind down"). The OBQ-44 (Obsessive Compulsive Cognitions Working Group, 2005) is a 44-item self-report scale that assesses beliefs common in individuals who have obsessive-compulsive disorder and related problems. Items on the scale fall into three factors that assess a) over-responsibility and perceived threat of harm, b) perfectionism and intolerance of uncertainty, and c) over-importance of thoughts and of controlling thoughts. The self-report diagnostic screening measure includes screening questions (e.g., questions about substance use) that help the clinician identify areas where additional diagnostic assessment is needed. The measure was developed at the San Francisco Bay Area Center for Cognitive Therapy and the CBT & Science Center and is available at https://oaklandcbt.com/forms-and-tools-for-clinicians/.

The therapist added several other measures to Alexa's intake packet based on things the clinician learned during the brief phone interview. Because Alexa reported struggling with anxiety and worry, the therapist asked her to complete the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). Because Alexa described herself as over-reactive, the therapist administered the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Because Alexa complained of irritability and anger that could be symptoms of bipolar disorder or borderline personality disorder, the therapist administered the Altman Self-Rating Mania Scale (Altman, Hedeker, Peterson, & Davis, 1997) and the Borderline Symptom List-23 (Bohus et al., 2008).

Alexa arrived on time for her interview, and she had completed all of the intake measures the clinician assigned. The clinician asked Alexa's permission to spend the first five minutes of the session reviewing the scales quickly so that she could use the information to guide the interview. The therapist used that time to screen the scales for any evidence of risky behavior

(suicidality, self-harm, extensive substance abuse) that would need to be prioritized in the interview, and to get a sense of Alexa's presenting difficulties. Alexa's responses did not include endorsements of any suicidal intent, self-harm, or problematic substance use behavior.

The process of developing a diagnosis and formulation occur at the same time that the therapist is taking steps to build a collaborative and supportive therapeutic relationship. Alexa's therapist worked slowly and carefully to gather the information needed to develop an initial diagnosis and formulation, observing Alexa's responses to the assessment process as she went forward. We describe here some of the ways Alexa's therapist proceeded as she collected assessment information to develop an initial formulation and diagnosis of Alexa's case.

Observations of Alexa's appearance, demeanor and behavior provided invaluable information. Alexa was well-groomed and stylish, wearing dark eye make-up and a jean jacket over a black dress. As soon as she began talking about her difficulties in her relationships and with her boyfriend, Alexa began crying, and she was in tears at several points during the initial interview.

Alexa reported that the main problem that brought her to therapy was emotional over-reactivity, especially irritability and temper outbursts. The therapist could see the high emotions in Alexa's tears and distress as she talked about her interpersonal interactions and relationships. Alexa reported that small events, like a friend's failure to return a phone call or a customer's rudeness at work, could provoke intense irritation and anger, and sometimes she lost her temper in those situations. For example, when a customer at the donut shop who was standing right in front of the napkins asked Alexa where the napkins were, she became frustrated and responded with, "Open your eyes, they're right in front of you!"

Alexa's over-reactivity led to problems in her relationships with her co-workers, her boyfriend, her boss, and her friends. Alexa had developed a close-knit group of friends in high school that she remained close to as she attended community college. However, she described feeling frequently upset that she was excluded and ostracized by her friends, and she felt confused about the fact that when she spoke up about this to her friends, they indicated that Alexa was the one who was distancing from them!

Romantic relationships were particularly challenging for Alexa. She was in a relationship with a man who was 13 years older than she was, and whom she had dated for more than a year before he would commit to being exclusive. She stated that she did not feel comfortable in the relationship. She described feeling "on edge" and "paranoid" but was not able to articulate what was making her uncomfortable.

On the Borderline Symptom List 23 (Bohus et al., 2008), Alexa scored a 1.3. In a sample of 379 patients with borderline personality disorder, the mean score on the measure was 2.05 with a standard deviation of 0.9, so that Alexa fell within one standard deviation of the mean for individuals diagnosed with BPD (Bohus et al., 2008). Symptoms that Alexa rated "very strong" "in the course of last week" were: "I was lonely," "My mood rapidly cycled in terms of anxiety, anger, and depression," and "I was afraid of losing control." The therapist used clinical interview to assess for all of the DSM-5 symptoms of borderline personality disorder, and concluded that

Alexa met criteria for two of the symptoms: affective instability and anger, both of which Alexa reported were long-standing. Although Alexa did report fears of being alone or of being abandoned, the clinician judged that she did not meet the criterion, "frantic efforts to avoid real or imagined abandonment" from the DSM-5 borderline personality disorder criteria. Alexa denied self-harm or suicidality or any of the other symptoms of borderline personality disorder.

To determine if the anger and irritability were part of a bipolar disorder, the clinician used a clinical interview to conduct a longitudinal assessment of manic or hypomanic symptoms, and used the Altman Self-Rating Mania Scale (Altman et al., 1997) to assess for current manic symptoms. Neither of these offered any evidence that Alexa had a bipolar mood disorder.

Alexa reported significant levels of depressive symptoms. She scored 22 (moderate depression) on the BDI-II, and endorsed symptoms of lack of enjoyment, self-criticism, feeling like a failure, disliking herself, and of feelings of worthlessness, fatigue, irritability, and agitation. On the Depression subscale of the DASS, Alexa scored 26, a score in the severe range based on the norms and severity ratings provided by Lovibond & Lovibond (1995). She endorsed "I found it difficult to work up the initiative to do things," "I felt that I had nothing to look forward to," "I felt down-hearted and blue," and "I felt that life was meaningless." Alexa reported thinking about death or suicide on the DASS, but when the therapist assessed suicidality in the interview she insisted she only occasionally had fleeting thoughts of wishing she was not there, but had no intention or plans to kill herself. The symptom that was most disturbing to Alexa was low self-esteem. She reported having low confidence, not feeling good about herself, and "just not feeling like myself." The therapist developed the major depressive disorder (MDD) hypothesis and offered a tentative diagnosis, and Alexa agreed that a diagnosis of depression made sense to her.

Alexa also reported that she worried quite a bit. The biggest source of worry was her interpersonal relationships and disruptions, but she also worried about her finances, her grades, and her future. She scored high on the PSWQ, scoring 75, a score in the range of patients who meet criteria for generalized anxiety disorder (GAD) (Antony, Orsillo, & Roemer, 2001). The therapist screened for GAD, using some of the items on the BDI-II to assist with this task (Alexa endorsed restlessness, fatigue, difficulty concentrating, irritability, and sleeping less than usual). It became clear that Alexa met criteria for GAD, and the therapist explained this diagnosis to her.

Alexa reported she was under quite a bit of financial stress. She worked at a low-paying job in a donut shop, and she was supporting herself and paying for her education without help from her parents. Financial problems exacerbated Alexa's worry and anxiety. For example, a car rear-ended her in a parking lot (hit and run), leaving the back bumper of her car dragging the pavement. She could not afford to get the bumper replaced, but she needed the car to commute to work. As a result, she felt she had to do more damage to her car by knocking the bumper off completely so that the car was drive-able, and she constantly worried about getting ticketed because her registration stickers were not displayed properly.

Alexa's therapist placed 5 items on her problem list, as depicted in Figure 2: emotional over-reactivity, especially angry outbursts; interpersonal difficulties; depressive symptoms, especially low self-esteem; worry, and financial problems.

Mechanism Hypotheses

Alexa's therapist developed mechanism hypotheses based on multiple sources of information. One source was Alexa's description of problems with emotional over-reactivity, coupled with her elevated score on the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Alexa scored 80 on the DERS, a score that was at the very top of the average score in clinical samples (Gratz & Roemer, 2004). Alexa's mean subscale scores were highest for the scales that assessed Difficulty Engaging in Goal-directed Behavior and Impulse Control Difficulties. For example, she scored 5 (almost always), on the item, "When I'm upset, I have difficulty getting work done," and scored 3 (about half the time), on the item, "When I'm upset, I become out of control," items assessing Difficulty Engaging in Goal-directed Behavior and Impulse Control Difficulties, respectively. Based on these data, the therapist proposed that *emotion regulation difficulties* were a mechanism underpinning Alexa's emotional over-reactivity, including her angry outbursts and some of her interpersonal difficulties.

Additional sources of mechanism hypotheses were diagnoses and the self-report scales Alexa completed. The fact that Alexa met criteria for GAD suggested that she might be intolerant of uncertainty. *Intolerance of uncertainty* has been proposed as a core mechanism underpinning GAD (Dugas, Buhr, & Ladouceur, 2004). This hypothesis was supported by Alexa's score in the severe range on the Perfectionism and Intolerance of Uncertainty scale of the OBQ-44, and was reflected in her stating that she agreed "very much" with items such as, "It is essential for me to consider all possible outcomes of a situation." Interpersonal problems are filled with uncertainty, and uncertainty seemed so fraught with danger for Alexa that she simply avoided taking any action to resolve interpersonal problems. Her emotional upset and resentment would then continue to grow until she'd finally lose control and cry or yell at a relational partner, often in response to a relatively trivial event.

The therapist also hypothesized that *self-criticism* was a mechanism underpinning Alexa's difficulties. The therapist observed that Alexa was quite self-critical regarding her emotional outbursts, and when the therapist pointed this out to her, Alexa agreed that self-criticism was a problematic habitual response. Alexa had scored 2 (on a scale of 0 to 3) on the self-criticism item of the BDI-II. The therapist speculated that Alexa's tendency to respond to interpersonal difficulties with self-criticism inhibited her from thinking about her interpersonal difficulties in a detailed and nuanced way. As a result, Alexa could not engage in any problem-solving behaviors. Resentment and other painful emotions lingered and built up until she finally flared up in anger or burst into tears.

Alexa also reported an elevated score on the OBQ-44 subscale indexing *over-responsibility*. She scored 64 on the Obsessive Beliefs Questionnaire responsibility and harm scale indicating severely elevated levels of over-responsibility (Obsessive Compulsive Cognitions Working Group, 2001). For example, she endorsed "agree very much" in response to the statement, "I should make sure others are protected from any negative consequences of my decisions and actions." Alexa's feelings of responsibility for others impeded her from attending to her own emotions and needs and asserting effectively to get her needs met, and made her vulnerable to build-ups of emotion and resentment that eventually boiled over.

Later, Alexa and her therapist completed thought records during the course of the therapy that identified an additional mechanism. Thought records focused on several interpersonal situations converged to highlight a problematic belief that drove Alexa's behavior in many interpersonal situations, and this was the belief, *"If I speak up to get my needs met, the other person will get mad and attack, or leave, or be hurt by me."* The formulation that depicts Alexa's problems and mechanism hypotheses that was developed during the initial assessment, and elaborated later in treatment, is depicted in Figure 2.

Precipitants

Alexa reported that she had experienced an upsurge in her distress in the last three months or so that had caused her to seek treatment, and the therapist worked with Alexa to develop several hypotheses about the factors that had contributed to that upsurge. About six months ago, one of Alexa's co-workers, who suffered from fibromyalgia, began calling in sick frequently, leading Alexa's boss to ask her to cover the co-worker's shifts. Because she felt so responsible for her boss' business, and so frightened about what might happen if she refused, Alexa felt unable to decline her boss' requests. Between her job and school, she was working 90-100 hours per week, leading to stress and fatigue, and increasing her anger and irritability to unmanageable levels. Her boyfriend's recent agreement to make their relationship exclusive, even though something Alexa had been asking for, may have led to increased feelings of vulnerability and fears of abandonment. Alexa's closest group of friends had recently told her that they planned to move to the East Coast together. They had invited her to go with them, but she had decided to stay in California to finish her degree; this impending loss triggered feelings of abandonment, vulnerability, and distress that she found difficult to manage.

Origins

Alexa tearfully described a difficult childhood. She had grown up in Germany with a mother she described as harsh and critical. Her interactions with her father were marked by violence and abandonment. At the age of 5, her father tried to physically drag her out of her home during a violent fight he had with her mother. This was the last time Alexa interacted with her biological father. Soon thereafter he broke off his relationship with the family and left the country, and her parents subsequently divorced. Alexa's mother re-married a man that Alexa described as controlling and egotistical. Alexa's parents moved to Australia when she was 16, and Alexa reported that she "was not invited" to go with them. Instead, they arranged for her to move to the United States to live with her friend and her friend's mother. Alexa rarely saw her parents following the move and, when she did see them, their interactions were often argumentative and hostile. For example, the client described an occasion when her mother threw her drinking water on Alexa in a restaurant during a conflict. Alexa reported that when she called her parents to ask for help, her step-father tended to tell her that she was victimizing herself, and her mother was critical. When Alexa told her mother that she was struggling to maintain a good grade in a difficult class, her mother's response was, "You must not be trying hard enough."

It became evident that Alexa had had multiple early experiences of abandonment, abuse, criticism, and invalidation. In addition, her parents did not model or teach effective emotion regulation or interpersonal problem-solving strategies.

Developing an Initial Treatment Plan and Obtaining the Patient's Consent to Treatment

Before embarking on treatment, the therapist offers the patient a diagnosis, some formulation hypotheses, recommendations about treatment, ideas about what the treatment would look like, and the rationale for the therapist's recommendations. The therapist also offers some information about alternative treatment options that are available in the community. The therapist's goal is to provide the information necessary for the patient to make an explicit and informed decision to go forward with treatment, rather than sliding from assessment to treatment without the patient making a clear explicit decision.

The boundary between assessment and treatment can be fuzzy and difficult to maintain. The therapist works to maintain the boundary between assessment and treatment by periodically reminding the patient that s/he is still in the assessment phase, and patient and therapist are still collecting information to ascertain whether they want to go forward to work together, until the therapist offers treatment and the patient makes an informed decision to proceed.

In the third session, Alexa's therapist walked through the components of the informed consent process that had not yet been completed. The therapist had already offered the diagnoses of MDD and GAD, and had begun laying out the formulation diagram that described how she conceptualized Alexa's difficulties. Alexa had also been completing the DASS at every session and had been doing self-monitoring homework to collect information about her emotions, so she already had a feel for what the therapy would be like. In view of her good response and receptiveness so far, and the evidence base supporting the use of CBT for treatment of MDD and GAD, the therapist recommended CBT. The therapist described the therapy she proposed in general terms, pointing to the case formulation diagram as she explained that the treatment would involve teaching Alexa skills and strategies to improve emotion regulation skills, reduce need for certainty, self-criticism, and over-responsibility. The therapist described that therapy would also involve setting goals, monitoring progress toward the goals, and homework. The therapist also pointed out to Alexa that other types of psychotherapies were available in the clinic or in the community, if she would prefer. The case formulation approach to CBT resonated with Alexa. She was eager to begin treatment, and hopeful for change.

Treatment

Treatment begins with the process of setting specific, measureable, achievable goals. Then the therapist works collaboratively and transparently with the patient, using cognitive-behavioral interventions selected from ESTs and other sources to target the mechanisms described in the formulation. The therapist can select interventions from a wide variety of sources, including EST protocols, information about strategies that have been helpful to the patient in the past, the therapist's personal and therapeutic experience, and the basic science literature. The guiding principle of a case formulation-driven treatment is that the interventions target the mechanisms described in the formulation.

Setting treatment goals. Alexa and the therapist developed three goals for her treatment: 1) eliminate over-reactions, especially irritability and anger; 2) increase self-esteem and feelings of self-worth and reduce other symptoms of depression; and 3) feel more comfortable in her relationship with her boyfriend.

Alexa's treatment began in February and the Psychology Clinic would close at the end of May. For this reason, Alexa and the therapist agreed that it might not be possible to accomplish all of these goals. However, the goals list provided a good focus for the treatment.

Using the formulation to identify treatment targets. One way the formulation is useful is that it helps the therapist identify treatment targets, and often they are different from those the patient views as problematic. The formulation provides important guidance that prevents the therapist from getting drawn off track by the client's faulty formulation. As an example, Alexa reported that because she felt so on edge and insecure in the relationship with her boyfriend, she had concluded that she had "trust issues" (e.g., she told her therapist that she believed she had "trust issues" when she felt upset about the fact that her boyfriend went out to dinner with a group of friends, including his ex-girlfriend, and didn't invite her to join the group).

Reviewing the formulation helped the therapist understand that Alexa's belief that she had "trust issues" was not likely correct, and in fact was a self-critical view of herself that reduced her self-esteem and contributed to unassertiveness and angry outbursts. To both flesh out her assessment and to help the client think about this situation a bit differently, the therapist asked Alexa whether the boyfriend had ever done anything to lose her trust in the past, and the client acknowledged several occasions on which the boyfriend had lied. For example, on an evening when he had told her he was having a "boy's night out," Alexa's friend told her she saw the boyfriend at the movies with another woman. The therapist used Socratic dialogue to help Alexa realize that her lack of trust in the recent dinner situation was not evidence that she had "trust issues." In fact, feeling untrusting in this situation was completely valid. The therapist taught Alexa some basics of emotion, highlighting the way feelings like jealousy and distrust serve a function. Feelings can provide vital information about our relationships, and can be used to guide interpersonal problem-solving.

Alexa took in the new information avidly, and she and the therapist developed a homework assignment that called for her to monitor her feelings and notice when she felt she had "trust issues" to see how they might be related to her boyfriend's behavior. As a result of these conversations and exercises, Alexa began to have more confidence in herself, and stopped criticizing herself for having "trust issues."

Using the formulation to help solve problems in therapy. Another important role of the formulation is that it can help the therapist solve problems that arise in the therapy. Early in the therapy, Alexa cancelled two therapy sessions at the last minute. And even when Alexa did keep her therapy appointment, she was often so exhausted from her long work hours that it was hard for her to concentrate or get anything out of the session.

After the second last-minute cancellation, the therapist raised the issue of therapy attendance, choosing her words carefully, as she knew that Alexa was vulnerable to self-criticism. The therapist simply said, in a matter of fact tone, "Oh, I was so sorry you had to cancel last session. What happened?" Alexa reported that her boss had asked her to cover for her co-worker with fibromyalgia again. The therapist listened carefully and supportively, and Alexa offered a flood of emotion and details about her work situation. In addition to her resentment

about being asked to cover so many extra shifts at the last minute, Alexa was unhappy with several aspects of her work, including her salary and the demandingness of some of her customers.

The therapist used a thought record to flesh out the thoughts that had impeded Alexa from refusing her boss' request to cover for the ill employee. The therapist chose to focus on that situation, because Alexa's inability to say no in that situation had led her to cancel her therapy session. The thought record showed that key thoughts that drove Alexa's unassertiveness were, "If I say no, my boss's business will suffer, and I don't want to be responsible for harming the business," and "If I say no, my boss will refuse to honor my request, and she'll be angry with me."

Alexa's therapist used Socratic dialogue to help Alexa understand that refusing a request to work an extra shift was not likely to harm her boss' business, and that she was not responsible for the success of her boss' business. The therapist also helped Alexa design a behavioral experiment to test her hypotheses about what would happen if she let her boss know that she could not cover shifts for other employees on Thursday evenings (when she had therapy sessions). Alexa was able to assert herself to her boss, and learned that the results of her doing so were much different than she had expected: her boss was very pleasant, and readily agreed to stop asking Alexa to cover shifts on Thursday evenings.

Because the therapist tied Alexa's therapy-interfering behaviors to mechanisms in the case formulation of over-responsibility and fear of asserting herself, Alexa was able to identify skills she had already learned in treatment (e.g., the DEAR MAN skill [Linehan, 1993b]) that she could use to solve the problems that were preventing her from keeping her therapy appointments. By drawing from the case formulation when developing hypotheses and selecting interventions, the therapist can teach skills that will generate to multiple domains. And without the case formulation as a guide, the therapist may have chosen an intervention to persuade the client to keep her therapy appointments (e.g., lecturing on the importance of treatment or even reducing the fee) that did not draw on the shared formulation or address underlying mechanisms, which we predict would have been less effective.

Elaborating the formulation during treatment. In a session focused on an angry outburst that Alexa had had with a friend, Alexa's therapist worked with her to draw a diagram (see Figure 3) of a common cycle Alexa experienced. The cycle began with Alexa encountering an interpersonal situation that was upsetting. Alexa then failed to assert herself for any or all of several reasons: she did not attend to and validate her emotions, she feared that if she spoke up the other person would get angry or leave, or she felt over-responsible for the other person's comfort and well-being. Instead, Alexa responded by criticizing herself, worrying, and venting to her friends. None of these behaviors solved the problem, and eventually, Alexa's emotions and resentment boiled over, leading to exactly the conflict she was so desperate to avoid. The therapist gave Alexa a copy of the diagram, and kept it in the clinical record in a place where she and Alexa could refer to it frequently and use it to guide their work.

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Insert Figure 3 about here
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Using the case formulation approach to guide training. A case formulation-guided approach to treatment is helpful in the training process to both the trainee and the clinical supervisor. The case formulation can help trainees select interventions during the session for problems that the beginner therapist has not prepared to address. And having a formulation to call on helps increase the trainee's confidence. For trainees, having a formulation to serve as a guide to solve unexpected problems can be particularly important, as uncertainty over what will happen in a session can increase anxiety and reduce self-confidence if the therapist does not have a strategy or tool to guide problem-solving.

The session in which Alexa reported feeling upset about the fact that her co-worker was not doing her fair share of the clean-up work provides an example of how the case formulation can help the therapist address a situation she has not prepared to handle. Alexa reported that the way she went about asking her co-worker to pull her weight was by silently slamming a broom and dustpan in front of her at the end of the shift. Not surprisingly, her co-worker did not respond by giving Alexa the help she wanted. Instead, she rolled her eyes, scoffed, and continued to play on her cell phone. Alexa asked the therapist for help solving this problem.

Without a case formulation, a novice therapist could jump to any number of conclusions or explanations for her client's behavior. Perhaps the client lacks social skills; she doesn't know what words to use to assertively ask for help. Maybe she lacks theory of mind and has no idea what her co-worker might be thinking. Another possibility is that the client didn't realize she was resentful about the situation until she found herself slamming the broom and dustpan in front of her co-worker.

A case formulation helps the therapist identify the most likely hypotheses. Alexa's therapist used the formulation (see Figures 2 and 3) to identify a few mechanisms that were likely playing out in this situation. One mechanism was over-responsibility (e.g., Alexa's sense that she was responsible to her boss for doing all of the cleanup, including her co-worker's share if she did not do it). Another mechanism was Alexa's belief that if she spoke up to ask for help the co-worker would be angry and rupture their relationship. A third mechanism was Alexa's difficulties with emotion regulation, including her tendency to avoid and suppress negative affect. The therapist hypothesized that as a result of these mechanisms, Alexa repeatedly avoided speaking up to her co-worker about the co-worker's failure to pull her weight, until finally Alexa lost control and over-reacted by slamming the dustpan and broom in front of her co-worker.

The therapist kept her hypotheses in mind as she guided Alexa through a thought record, which helped her identify her thoughts and feelings in the situation with her co-worker, which she not been attending to. The therapist used careful Socratic questions to help Alexa realize that she was not responsible for doing all of the cleanup herself, and that carefully asking her co-worker for help in this situation was less likely to lead to conflict than Alexa's strategy of slamming down the dustpan. Alexa continued to learn that when she does not express her needs, her agitation rises, and eventually she over-reacts, which *does* lead to the interpersonal conflicts she tries desperately to avoid.

Alexa and the therapist collaboratively developed a homework assignment of politely expressing to her co-worker that she would appreciate her help with the cleanup at the end of the shift. Alexa carried out the assignment successfully, and her co-worker began giving her the cleanup help she wanted. Had the therapist not had the case formulation to reference, she may not have understood what impeded Alexa's ability to speak up assertively and may not have intervened as effectively to help Alexa change her behavior.

Another training advantage of learning a case formulation-driven approach to CBT is that, unlike learning a treatment protocol that targets a certain diagnosis or set of symptoms, training in the case formulation approach provides new therapists with idiographic hypothesis-testing skills that can be generalized to any set of symptoms.

A case formulation-guided approach to treatment is also helpful to the clinical supervisor. The supervisor usually does not have the detailed moment-by-moment information about the client that s/he uses to guide clinical decision-making when in the therapist role, and instead must often rely on a 30,000 feet up view. The formulation and the plot of the progress monitoring data provide that view. The case-formulation can serve as a compass, helping the supervisor point the trainee in the right direction, and the progress monitoring data (described in the next section) help the supervisor (and trainee, and patient) determine whether therapy is moving forward smoothly.

Monitoring Progress

As treatment proceeds, the patient and therapist collect data at every therapy session to test the formulation and monitor the process and outcome of therapy. Monitoring progress at every therapy session has been shown to lead to improved outcome (Lambert et al., 2005). In addition, the therapist will want to monitor the alliance and other aspects of the process in a moment-to-moment way in the session (see Hunsley & Allan, this volume). Useful monitoring tools appear in Antony et al. (2001), Fischer and Corcoran (2007), and Nezu, Ronan, Meadows, and McClure (2000).

Data collection allows patient and therapist to answer questions like: *Are the symptoms remitting? Are the mechanisms changing as expected? Do the mechanisms (e.g., over-responsibility) and symptoms (e.g., angry outbursts) co-vary with each other as expected? Does the patient accept and make use of the interventions and recommendations the therapist offers? Do any problems in the therapeutic relationship interfere with treatment?* If the process or outcome of therapy is poor, the therapist can often use the formulation (as in the example above of Alexa's cancelling her therapy sessions) to assist in the problem-solving process (see also Persons, Beckner, & Tompkins, 2013).

Alexa's therapist used the DASS (Lovibond & Lovibond, 1995) to monitor her progress, and she asked Alexa to complete the measure in the waiting room before each session and bring it in to the session. When Alexa brought the measure into the session, the therapist scored it on her laptop (the DASS and a free scoring tool are available at https://oaklandcbt.com/forms-and-tools-for-clinicians/ and reviewed the plot with Alexa at the beginning of the session to get an initial read on how Alexa's week had gone and how the

therapy was going. When Alexa began treatment, she scored 26 (severe) on the Depression scale and 20 (moderate) on the Stress scale of the DASS. As Figure 4 shows, Alexa's symptoms were no longer in the severe range after only a few sessions of treatment, a pattern that has been shown to predict a good outcome (Persons & Thomas, 2018). Her therapist also monitored Alexa's progress by collecting feedback at every session such as: which interventions were most helpful, which skills she was able to implement outside the session, and which skills she was not able to implement.

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Insert Figure 4 about here

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Terminating Treatment

In an ideal treatment, therapy comes to an end when the progress monitoring data show that the patient has accomplished his or her goals. In this case, because therapy was being done in a training clinic that was closing for the summer, the treatment had to end after only 11 sessions. Alexa and the therapist spent the last session of Alexa's treatment reviewing progress toward her goals, and her scores on the self-report measures she had completed over the course of treatment.

With regard to her goals of reducing over-reactions, especially irritability and anger, Alexa reported feeling very happy with her progress. She reported that she was much more calm and positive at work, and she attributed this to therapy. She stated, "I'm better at dealing with my feelings and not exploding on people." These reported improvements in managing her emotions, especially anger and impatience, were reflected in marked changes in her score on the Stress scale of the DASS, where at termination she scored 4, in the normal range, as compared to her score of 20, in the moderate range, at intake (see Figure 4). At termination she scored 0 on the DASS Stress scale item measuring irritability, as compared to her score of 3 on that item at intake.

Alexa also made progress toward her goals of increasing self-esteem and reducing other symptoms of depression. She reported feeling much better about herself, and quite a bit happier. This shift is reflected in her scores on the Depression scale of the DASS, on which she scored 8 at termination, in the normal range, as compared to 26 at intake (see Figure 4).

With regard to Alexa's goal of feeling more comfortable in her relationship with her boyfriend, Alexa felt she was handling the relationship better. She still struggled to feel comfortable in the relationship, but she was working on paying attention to her emotions of distrust, and instead of blaming herself for having "trust issues," she now considered whether he had given her any reason to feel distrust. Alexa was spending slightly less time worrying about her relationship, which was reflected in some improvement on the PSWQ. Her score on the PSWQ was 64 at termination, as compared to a 76 at intake.

When asked what she had gotten out of her therapy, Alexa said: "I can vent a lot to my friends, but therapy is different. We find lots of things I can try, so now I'm much better at finding solutions to handle the stuff that's pissing me off or stressing me out."

Alexa's scores on the measures of mechanisms underpinning her symptoms indicated that although she had made some gains, she had much room for improvement and would benefit from continued therapy. At termination, she scored 11 on the DERS scale of difficulty engaging in goal-directed behavior, as compared to her score of 19 at intake, and she scored a total score of 65, as compared to her score of 80 at intake. Her score on the OBQ-44 scale measuring over-responsibility was improved, but remained elevated; at intake her score was 64, and at termination it was 51. Her score on the OBQ-44 scale indexing intolerance of uncertainty was essentially unchanged (she scored 82 at intake and 85 at termination), a score that was consistent with the fact that treatment did not focus much on intolerance of uncertainty.

Based on these scores, Alexa's therapist recommended that Alexa seek additional treatment. The therapist referred Alexa to low-fee clinics where she could be seen over the summer, and also let her know that she was welcome to return to the Psychology Clinic in the fall.

Return to Treatment

Alexa did not seek any treatment over the summer, but she did return to the Psychology Clinic in the fall of 2016, when the clinic reopened after the summer break, and she began treatment with the third author (A.E.D.). We report here some follow-up data for the treatment described earlier by reporting on Alexa's status when she returned to treatment.

Alexa stated that she came back to therapy because she had recently broken off her relationship with the boyfriend she had been seeing during her first treatment episode, and she wanted help because she was feeling lonely and unsupported, and feeling guilty and over-responsible for causing him distress. Alexa still had difficulties asserting herself, including with men she was starting to date. Alexa endorsed some symptoms of depression, but noted that these symptoms were much less severe than when she had initially sought therapy. Her score on the BDI-II was 15 (she had originally started treatment with a score of 22), and quickly dropped to the normal range and stayed there throughout her second course of treatment. Alexa's score on the DASS Depression scale was a 0 (she had originally started her first course of treatment with a score of 26), and continued to be in the mild range for the duration of treatment with the new therapist. Alexa reported that worry continued to be a problem, and she scored 67 on the PSWQ. Based on a clinical interview and the International Neuropsychiatric Interview (M.I.N.I. 7.0), a structured diagnostic interview for DSM-5 disorders, the therapist assigned the diagnoses of Anxiety Disorder Not Otherwise Specified and Major Depressive Disorder in Remission.

Alexa reported that, in comparison to when she had initially sought treatment, she was now feeling "*a lot more like myself, and it [feels] better.*" She reported that her main treatment goal at this point was to "*to maintain this level of normality.*" Alexa reported that in her previous therapy, she had learned skills for speaking up when she was uncomfortable, instead of criticizing herself, venting to her friends, or reacting with anger, as she had typically done in the past. As a result, her relationships with her boss, co-workers, and friends were smoother and more stable. Her improved ability to advocate for herself and her own needs was reflected in her improved ability to keep her therapy appointments; she did not cancel any sessions.

Final Discussion

We described a case formulation-driven approach to CBT and briefly reviewed its empirical underpinnings, using a case example to illustrate how the use of a case formulation can guide treatment and clinical decision-making by helping the therapist solve problems that arise in treatment. We also discussed ways a case formulation-driven approach can contribute to the training of clinical scientists.

We offer several suggestions for next directions in research, clinical practice, and training related to case formulation. A case formulation-driven approach to treatment, with its focus on transdiagnostic mechanisms, lends itself to the application of the types of mechanistic research findings that flow out of the RDoC approach that NIMH recently adopted (Insel et al., 2010). Now that NIMH is moving toward an RDoC approach, we expect that randomized controlled trials of manualized disorder-focused treatments will become more rare, and research on mechanisms underlying problems or symptoms will become more common. The case formulation approach allows clinicians to readily apply findings that that flow out of the RDoC strategy. As a result, we can hope that RDoC and the case formulation-driven approach to treatment might contribute to narrowing the scientist-practitioner gap.

Additional research is needed to validate the treatment utility (Hayes, Nelson, & Jarrett, 1987) of the case formulation – that is, to test the hypotheses that reliance on a case formulation-driven approach to treatment improves outcomes and helps therapists solve problems in therapy, including noncompliance, low motivation to change, dropout, and failure. Studies of the degree to which therapists are more willing to adopt flexible, formulation-driven treatment than fixed manualized treatment are also needed.

To make it easier for clinicians to use a case formulation-driven approach to treatment – and to do evidence-based practice more generally -- clinicians need easier access to inexpensive measures they can use to assess symptoms, problems, diagnoses, and mechanisms, and to assess change during therapy. The work of (Beidas et al., 2015) reflects some important efforts to address this problem; more are needed.

Therapists who want to do evidence-based practice struggle to adapt the ESTs, which tend to target single disorders, to the multiple comorbid cases that are common in clinical practice. The case formulation-driven approach to treatment is an attempt to bridge the gap. It offers a systematic strategy the therapist can use to build a formulation of the patient, not the disorder, and to use an empirical approach to the case. However, when s/he follows this method, the therapist often cannot adhere to the evidence-based disorder-focused EST protocols. To address this problem, we encourage treatment developers to develop and conduct randomized controlled trials to study protocols that include important elements of a case formulation-driven approach (idiographic treatment goals, a formulation of the case, flexible selection of interventions guided by the case formulation, and progress monitoring at every session). The modular treatments developed by Weisz and colleagues (2012) and the principle-driven treatment of DBT (Linehan, 1993a), which relies heavily on using the result of idiographic progress monitoring (the Diary Card) to guide the treatment, have taken some initial steps in this direction. Related, we encourage treatment developers to devise interventions that target the

transdiagnostic mechanisms that are common to many disorders rather than developing a package of interventions that treats a single disorder. Clinicians using a case formulation-driven approach to treatment would also benefit from research that yields an armamentarium of evidence-based interventions or practices (kernels, as described by Weisz, Ugueto, Herren, Afienko, & Rutt, 2011), rather than ESTs that clinicians must dismantle in their efforts to individualize the treatment to meet their patients' needs.

In the training arena, we argue that learning to use a formulation-driven approach to treatment is particularly valuable in clinical science training settings. As Shiloff (2015) points out, clinicians who learn to do therapy using EST protocols don't learn to use the scientific method to think about their clinical work. Instead they learn how to look in the protocol to find the answer to their question. In contrast, learning to do clinical work by developing and testing hypotheses, and collecting data to test hypotheses, means that a student can use the same scientific method in both clinical work and research. Training in the case-formulation approach teaches young clinical scientists to identify psychological mechanisms that underpin symptoms and behaviors, skills that are useful in both the clinical and research domains.
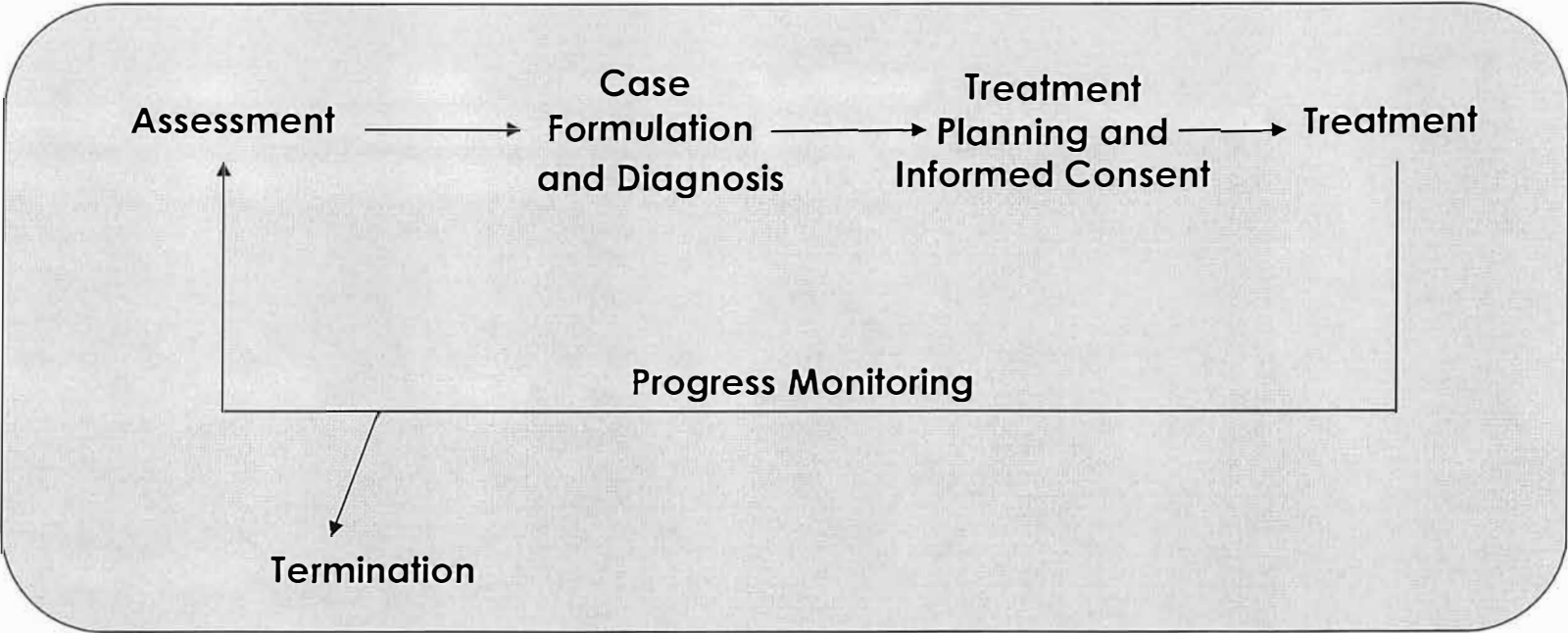
Acknowledgement

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Figure 1. Case Formulation-driven Cognitive-behavior Therapy

Assessment → Case Formulation and Diagnosis → Treatment Planning and Informed Consent → Treatment

Progress Monitoring

Termination

☐ = the therapeutic relationship

Box (left, bulleted list):
- difficulty w/ emotion regulation
- self-criticism
- over-responsibility
- intolerance of uncertainty
- "If I speak up, the other person will attack/leave/be harmed"

emotional over-reactivity, esp. angry outbursts

interpersonal difficulties
- work
- bfr
- friends

financial stresses

worry

depressive symptoms, esp. low self-esteem
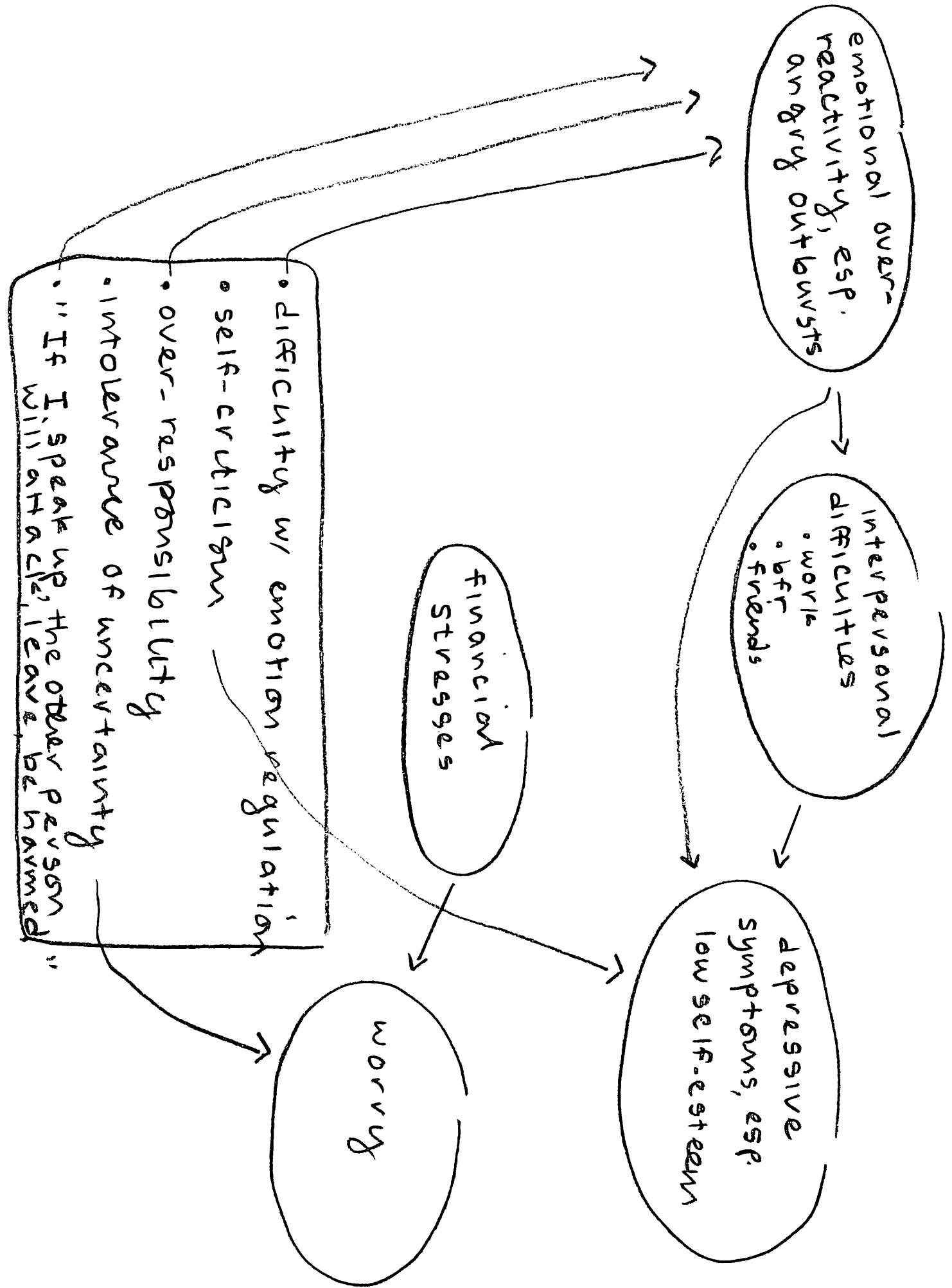
Event
involving
rejection,
neglect,
disrespect

feeling
resentful,
neglected

"If I speak up,
something bad
will happen."

self-criticism

no action
to solve
the
problem
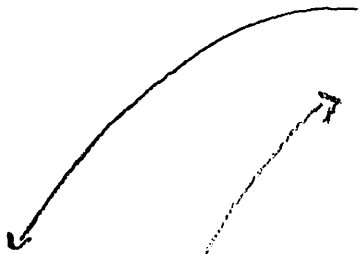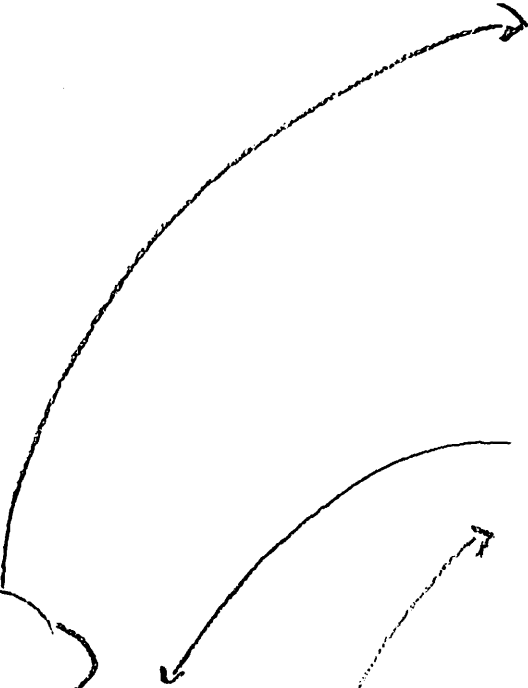
worry

vent to
friends

ANGRY
BLOW UP
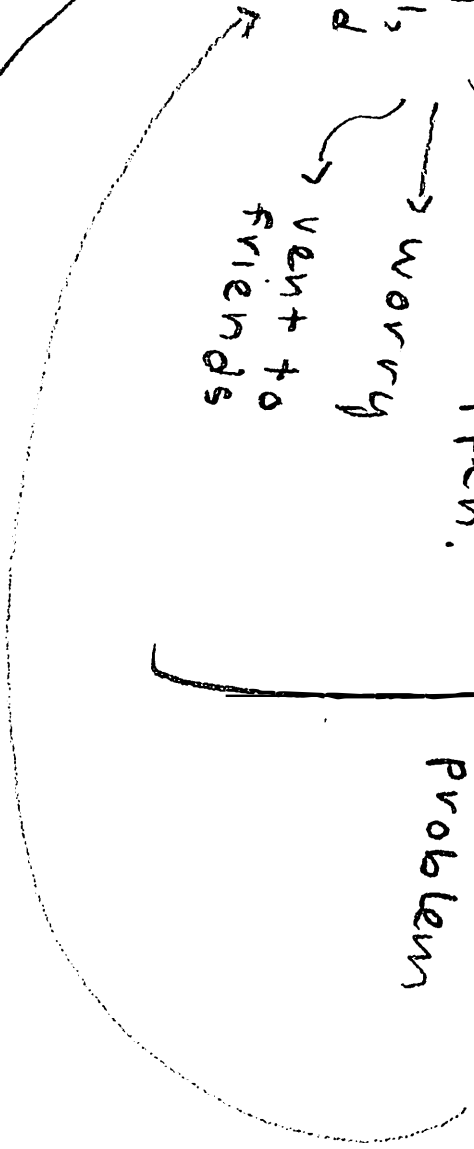
Figure 4. Alexa's scores on the Depression Anxiety Stress Scales During Treatment
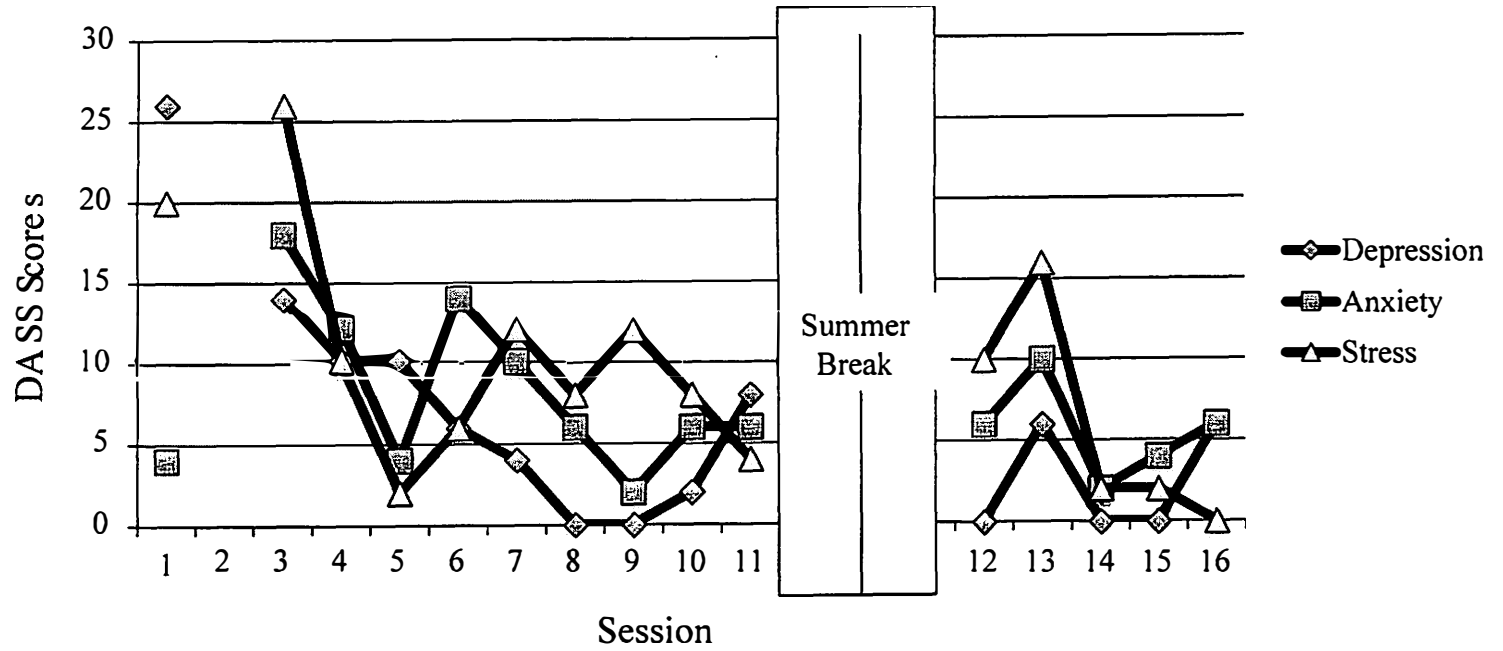
Figure 1. Case formulation-driven cognitive behavior therapy

Figure 2. Hand-drawn formulation of Alexa's presenting problems and psychological mechanisms developed by the therapist in the session with the patient

Figure 3. Hand-drawn formulation of Alexa's angry outbursts developed by the therapist in the session with the patient

Figure 4. Alexa's scores on the Depression Anxiety Stress Scales during treatment