**Background**

While there is evidence that psychotherapy is effective for a majority of people, research consistently shows that some people do not achieve positive outcomes over the course of treatment (Finch, Lambert, & Schaalje, 2001). Studies have estimated that 30-50% of clients fail to respond to treatment, with 5-10% of clients actually worsening during treatment (Lambert & Ogles, 2004). Further, clinicians consistently fail to predict negative outcomes in their own clients and underestimate the incidence of negative outcomes in general (Hannan et al., 2005).

Routine outcome monitoring (ROM) aims to address this clinician blind spot by capturing client progress at regular intervals throughout treatment, ideally at every session. Building on this, patient-focused research uses data sets of ROM data from past clients to model average change trajectories over the course of treatment, often stratified by initial distress and other client characteristics at intake. A client’s actual change during treatment is compared to their predicted change trajectory, and this information is then provided to clinicians as feedback to inform treatment (Boswell, Kraus, Miller, & Lambert, 2013). The feedback can alert a clinician when a client is not on track for a positive outcome (NOT) or whether their progress is on track (OT) with past similar clients.

* Review of existing feedback systems and the methods they use
  + Many feedback systems have been developed: OQ, CORE-OM, and PCOMS.
  + Many of these outcome monitoring and feedback systems are based on the expected treatment response (ETR) method for predicting clients’ change trajectories. The ETR method uses longitudinal datasets of previous psychotherapy clients to model change based on pretreatment predictors. This method is based on the dose-effect model of change, which describes a normative pattern of improvement over the course of therapy. This course is characterized by rapid symptom improvement in earlier sessions, followed by increasingly more sessions needed to achieve the same amount of change. As such, this treatment trajectory follows a logarithmic curve.
  + Typical method for establishing alerts
    - For example, in one prominent outcome monitoring instrument, the OQ,
    - 10% tolerance interval, corresponding with the 10% deterioration rate
* Review of literature on effectiveness of feedback
  + Feedback has been shown to help prevent treatment failure in NOT clients (Shimokawa, Lambert, & Smart, 2010). Generally, for clients already on track, receiving feedback that they are on track does not improve outcomes (﻿Crits-Christoph et al., 2012; Harmon et al., 2007; de Jong et al., 2012; Lambert, Whipple, Smart, Vermeersch, & Nielsen, 2001; Lambert et al., 2002; Probst et al., 2013; Simon, Lambert, Harris, Busath), although some studies do find a positive effect of feedback for on track clients as well (Amble, Gude, Stubdal, Andersen, & Wampold, 2015)
  + Same percentage of clients in feedback and no feedback conditions go off track (Amble, Gude, Stubdal, et al., 2015).
  + Some findings showing that it shortens treatment in OT clients, but most shows no effect for OT clients (citation).
  + Clients in feedback and no feedback conditions who went off track had similar trajectories up to the point that the feedback condition clients received feedback, at which point their trajectory departed, indicating that the off track feedback was the effective component (Amble, Gude, Stubdal, et al., 2015)
  + Although clients’ slopes improved after they received feedback, clients in a no feedback condition also had improved slopes after they went off track (when they would have received feedback), and the post-feedback slopes in the two conditions weren’t significantly different, failing to conclusively conclude that feedback results in improved rate of change. Instead, authors posit that signals tend to occur at high scores which are more likely to regress to the mean, potentially accounting for the decreasing slopes in both conditions (Amble, Gude, Ulvenes, Stubdal, & Wampold, 2015)
  + Previous studies showing FB to be effective across different systems
    - PCOMS (Duncan, 2012)
    - OQ (Lambert & Shimokawa, 2011)
    - Meta- analysis showing effect of *d* = .28 for all clients and *d*  = .53 for NOT clients (Shimokawa et al., 2010)
  + Previous studies showing less promising results
    - Meta-analysis showing small effect of *d* =.10 (Knaup, Koesters, Schoefer, Becker, & Puschner, 2009)
    - No overall effect, but effect for NOT clients using OQ (de Jong, van Sluis, Nugter, Heiser, & Spinhoven, 2012)
* How/why/when is feedback effective?
  + ﻿Trajectories of NOT patients were similar in FB and NFB conditions until the therapist in the FB condition was signaled that the patient was off track, but from that point forward the outcomes of patients in the FB condition improved significantly more than those in the NFB condition (Probst et al., 2013)
* For whom is feedback effective?
  + For clients that start more distressed, who are more likely to deteriorate (Lambert et al., 2001), although another study found that client initial distress did not moderate the effect of feedback (Amble, Gude, Ulvenes, et al., 2015)
  + Other prior research on client moderators of effectiveness of feedback
* Introduce CCMH
* Introduce CCAPS
* Describe development of CCAPS feedback curves and methods
  + Previous ROM report provided CCAPS data in a tabular format, with each column representing a CCAPS subscale, and rows for each CCAPS administration. Although the CCAPS scores are used in research as the mean of all items on a subscale (ranging from 0-4), in clinical practice, scores are presented as percentiles.
    - Figure of old report
  + The new feedback system introduced several new features
    - Graphical display of a client’s actual data, allowing for ease of interpreting trends across administrations
    - Graphical display of expected recovery trajectory for past clients starting at a similar level of distress on that subscale
    - NOT feedback, which was absent if a client was OT, and present if a client was NOT
  + Methods of developing expected treatment trajectories and feedback system
    - Ns
    - Each subscale was independent
    - Binned by initial severity
    - Feedback alerts based on 90% tolerance intervals
  + Limitation of clients that can’t alert because they start too high
* Goals of this study
  1. Evaluate whether counseling center outcomes improved after the implementation of the feedback system- did the feedback system cause improvements on a broad scale
     + This would be above and beyond the effect of routine outcome monitoring alone, which was in place prior to the feedback system
  2. Does feedback improve outcomes for individual clients who alerted? Do client trajectories of change improve after they alert?
  3. Evaluate whether feedback is differentially effective by client characteristics. Possible client characteristics listed below.
     + Mental health history items
     + Frequency of CCAPS administration
     + Total number of sessions
     + When in treatment the first alert occurs
     + Number of alerts a client receives
     + Variability in client’s scores
       - Are alerts more effective for stable or unstable clients?
     + Whether the client was in other treatment modalities besides individual therapy

**Methods**

* Research question 1
  + Data cleaning
    - Include two years of data before profile report was introduced (2013-2015), and two years of data two years after the profile report was introduced (2017-2019)
      * Only include centers that are present in all four of those years
    - Remove clients who started high enough that they couldn’t alert
    - Remove clients below low cut?
  + Analyses
    - Rate of clients going off track before and after profile report
    - Rate of change before and after profile report
      * 3 level model: CCAPS within clients within centers
      * Client level predictor of whether they were seen before or after the profile report was introduced that will test this main hypothesis
      * Any other variables to include here as controls? If baseline CCAPS differs by year, I’ll include baseline severity as a control variable
    - Raw change before and after profile report
      * 2 level model: Clients within centers
    - Rate of deterioration before and after profile report
* Research question 2
  + Data cleaning
    - Include two years of data before profile report was introduced (2013-2015), and two years of data two years after the profile report was introduced (2017-2019)
      * Only include centers that are present in all four of those years
    - Only include clients who alerted or would have alerted
    - Remove clients below low cut?
    - Minimum number of sessions?
    - Exclude clients who alerted late in treatment?
  + Analyses
    - Piecewise longitudinal model evaluating whether the slope of a client’s change differs before and after their first alert, or the first session they would have alerted (Amble, Gude, Ulvenes, et al., 2015; Probst et al., 2013).
    - Center each client’s data around the session at which they first alerted or would have alerted
    - Intercept represents their CCAPS score when they alerted
    - Coding options for testing the impact of feedback- need to investigate further to decide which to use
      * Contrast code sessions before and after first alert to compare slopes (0, 1)
      * Two codes for slope (0, 1, 2, 3, 4 & 0, 0, 1, 2, 3)
      * Splines
    - Include a code for whether they were seen before or after the feedback system was released and an interaction with the
* Research question 3
  + Data cleaning same as above
  + Analyses
    - Same as above, but testing moderators

**Results**

* Descriptives
  + % of clients with an alert
  + When in therapy alert occurs
  + Compare clients who alerted and didn’t
    - Average starting CCAPS
    - Average # of sessions

**Discussion**

* Important questions we weren’t able to answer
  + How often were therapists attending to the CCAPS and specifically to the feedback it provided? Does this mediate its effectiveness? We’d hope so!
  + Does the effect differ based on whether therapists discussed feedback, or CCAPS scores generally, with clients?
    - It’s not clear whether providing FB to both clients and therapists is more effective than providing to therapists alone
      * No difference (Shimokawa et al., 2010)
      * More effective when given to both (Knaup et al., 2009)
  + At a therapist level and structural center level, is the effectiveness of the new feedback system moderated by attitudes toward outcome monitoring or towards a change in routine? For example, a feeling that the change was imposed top down by center administrators could attenuate its effectiveness, potentially through therapists not attending to the feedback.
  + Is the effectiveness moderated by the way in which the new CCAPS system was introduced and if there was any training surrounding it?
* Limitations
  + Not an RCT, and no true comparison group available
  + Can’t rule out the effect of time, which was perfectly confounded with the introduction of the profile report