Constraint-induced Language Treatment: Time to Rethink?

Constraint-induced Language Treatment (CILT, CIAT) first emerged into clinical practice in aphasia treatment following publication of the Pulvermüller et al., paper in 2001. Since then CILT has engendered clinical research application (e.g. Kirmess & Maher, 2010) and a systematic review (Cherney et al., 2008, 2010) and in clinical practice has appeared as the featured treatment program in several aphasia treatment programs and garnered attention from third party payors. The history of CILT is relatively well known by now, having derived from Constraint-Induced Movement Therapy which has a rich literature base that includes literature on neuroplasticity and motor skill learning. Equally well known are the treatment principles of CILT: constraining the response format, treating in an intensive schedule, and shaping verbal responses.

In the ten years since CILT was first introduced to the aphasia treatment community publications reporting its use have begun to test the limits of its applicability. For example, Meinzer, Obleser, Falisch, Eulitz and Rochstroh (2006) used CIAT in a single subject study of an individual who was bilingual in German and French as she recovered from aphasia. Brier, Juranek, Maher, Schmadeke, Men and Papanicolaou (2009) examined neurophysiologic and behavioral performance in 23 individuals with aphasia before and after participation in CILT. Finally Goral and Kempler (2009) modified CIAT stimuli and responses in their treatment program for one individual. The evidence for CILT is equivocal (Raymer, Patterson & Cherney, 2011), in part related to variability in participants and methodology. In this project we examine CILT from the perspective of the underlying treatment principles rather than as a prescriptive treatment. The report presents our argument in four parts: 1) review of the evidence reporting CILT treatment studies; 2) alignment of the treatment principles of CILT with treatment principles that formed the basis of aphasia treatments for many years; 3) comparison of CILT and other aphasia treatment techniques, in particular those that involve an intensive treatment schedule; and 4) rethinking CILT.

Part One: CILT evidence. Eighteen studies reporting data on 202 participants are included in the evidence review, taken from previous reviews of CILT (Cherney et al., 2008, 2010, Raymer et al., 2011). Tables will show treatment significance and effect size for multiple dependent variables and are organized by the type of outcome measure (impairment or activity/participation), nature of the outcome measure (e.g. aphasia battery or single word naming), and aphasia chronicity (acute or severe). Conclusions from the data for impairment-based outcome measures in one study of individuals with acute aphasia showed performance improvement. For studies of individuals with chronic aphasia three patterns appeared: 1) exploratory studies reported mixed results; efficacy studies noted significant change for most participants; and 3) most participants had nonfluent aphasia. In studies that included communication activity/participation outcome measures, the one study of individuals with acute aphasia again showed change on treatment task. Studies including individuals with chronic aphasia showed results that generally favored CILT as a change agent in intervention although importantly, variations were noted in tasks and response targets.

Part Two: Treatment principles. Pulvermüller et al., (2001) note, "the effective therapeutic factor in CI (motor) therapy is massing…practice", "constraint may be viewed

simply as an adjunctive technique…", and it is important to "…implement constraints…to force the patient to engage in massed practice…" (p. 1621), all to be applied in a therapeutic setting that is, "…tailored to patients' needs in everyday communicative life" (p. 1622). CILT thus became a treatment where communication was verbal with gesture or writing not permitted (Pulvermüller et al., 2001, p. 1622). This section of the presentation will identify other treatment techniques that also use the principles that underlie CILT. For example, Schuell advocated for multiple repetitions of stimuli in her stimulation-facilitation technique (Schuell et al., 1964), Linebaugh and Lehner (1977) described a protocol that incorporated response shaping in development of individualized cueing hierarchies for treatment plans, and Lubinski (2008) has long argued for consideration of environmental needs in designing treatment for persons with aphasia. This section will present several classical treatment techniques, and their theoretical foundations, in comparison with CILT. These results will be used to make the argument that while CILT is an effective intervention for some individuals with aphasia in specific clinical protocols, its effect as a prescriptive treatment may not be exclusive.

       Part Three: Comparison to current aphasia treatment. Therapeutic principles such as shaping, stimulus salience, and treatment frequency and intensity appear in contemporary aphasia treatment. For example, Lee, Fowler, Rodney, Cherney and Small (2010) report preliminary results of INITATE, an intensive, computer-based treatment or oral repetition. IMITATE incorporates intensive treatment and incremental learning into treatment protocols. Treatment intensity as well as everyday communicative need are principles of AphasiaScripts (Lee, Kaye & Cherney, 2009), a protocol that uses an animated agent to produce natural speech scripts designed by patients. Finally, Laganaro, DiPietro and Schnider (2006) examined treatment intensity in a protocol for word retrieval deficit from the perspective of the number of treated items and the number of repetitions. This section will highlight these and other recently published treatment studies, cross-referencing treatment principles in an effort to highlight similarities as well as differences.

       Part Four: Rethinking CILT. Constraint-induced Language Treatment is an effective treatment technique under some circumstances; however the active ingredient in CILT is not clear. Pulvermüller and Berthier (2008) described a technique similar to CILT termed Intensive Language Action Therapy (ILAT) and discuss principles underlying aphasia within this framework. Given the number and variety in modifications to the original CILT protocol reported in recent literature, and the redirection in Pulvermüller and Berthier (2008), it is reasonable to conclude that CILT may best be viewed in a light other than as a specific prescriptive treatment. The original intent of CILT (Pulvermüller et al., (2001) is as a technique, "…realized in a communicative therapeutic environment constraining patients to practice systematically…". This section will present the position that CILT may be identified as one among a number of aphasia treatment protocols. Constraint-induced Movement Therapy has been described as a family of treatments for individuals with motor disability. Although commonalties can be noted between motor learning and language (re)learning, we suggest that rather than implement a corollary with CILT/ILAT identified as a family of treatments for aphasia, that emphasis in treatment design be placed on principles of neurologic recovery and learning theory.

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