

Using language for social interaction: Communication mechanisms promote recovery from chronic non-fluent aphasia

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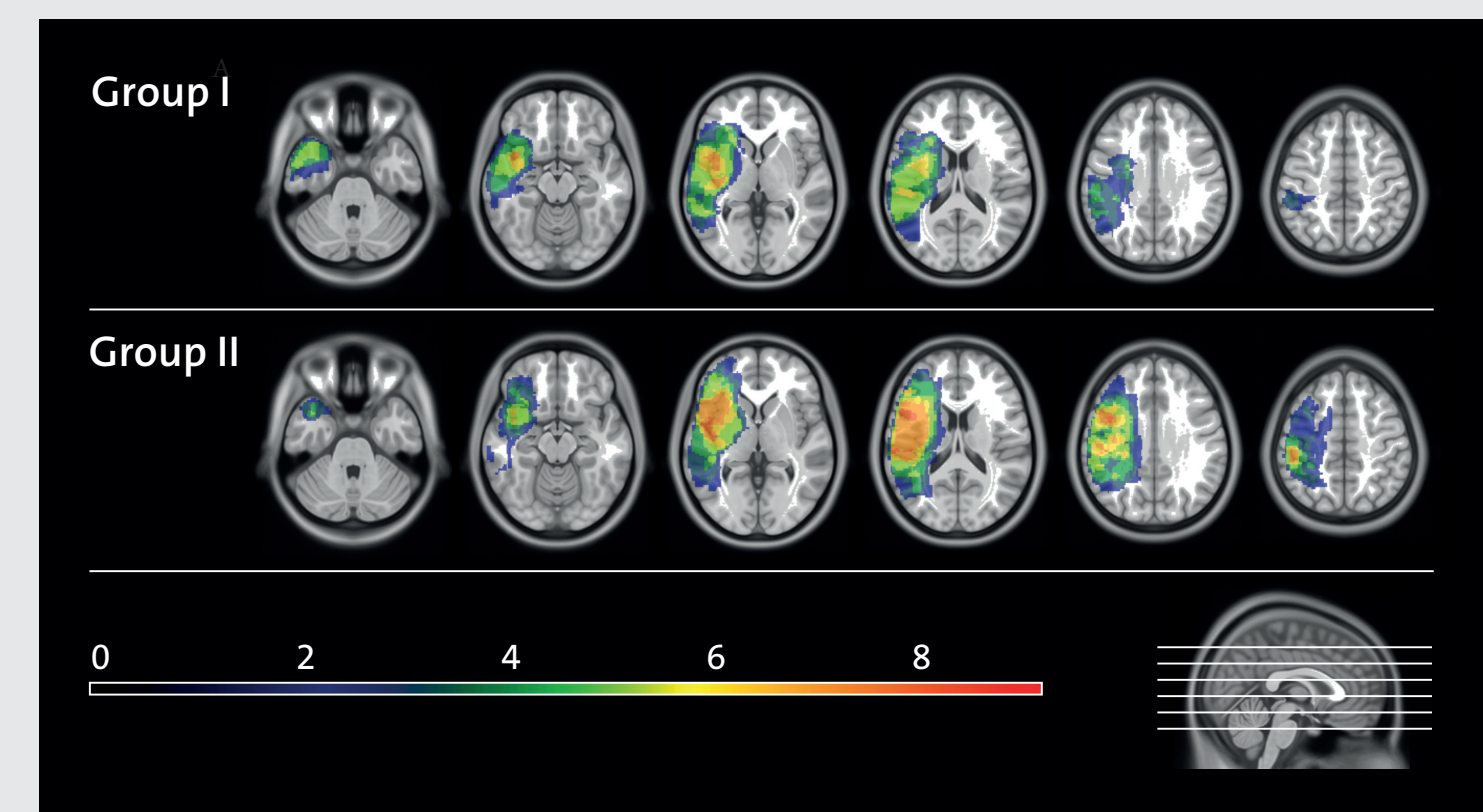
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1. Introduction

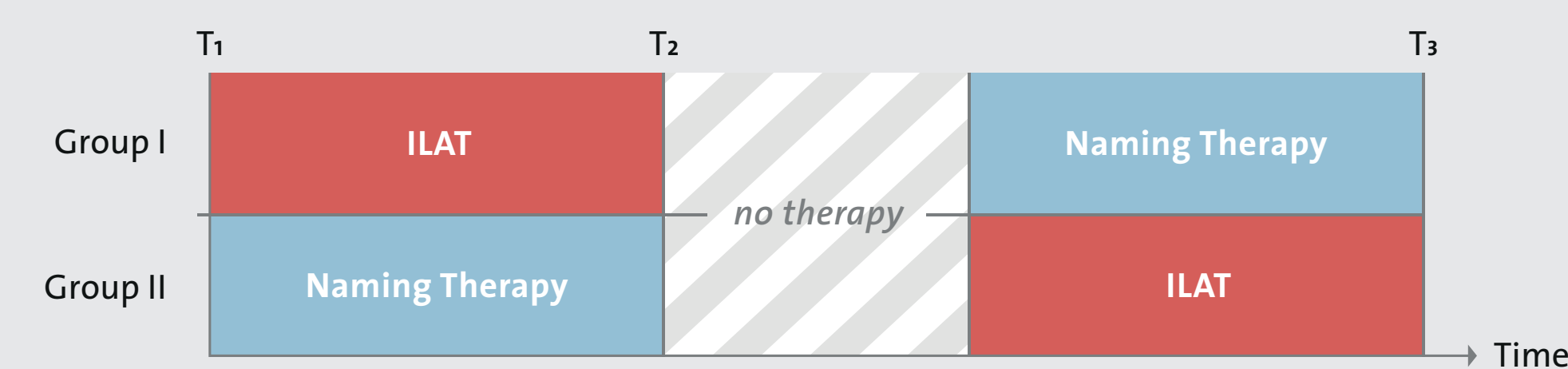
Clinical research highlights the importance of massed practice in the rehabilitation of chronic post-stroke aphasia (Brady *et al.*, 2016). However, while necessary, massed practice may not be sufficient for ensuring progress in speech-language therapy. Motivated by recent advances in neuroscience, it has been claimed that using language as a tool for communication and social interaction leads to synergistic effects in left perisylvian eloquent areas (Berthier & Pulvermüller, 2011). Here, we conducted a crossover randomized controlled trial to determine the influence of communicative language function on the outcome of intensive aphasia therapy.



Lesion overlay maps. Individuals with left-hemisphere lesions and chronic aphasia were randomly assigned to Group I or Group II. Colors indicate the number of lesion overlaps in each group.

2. Methods

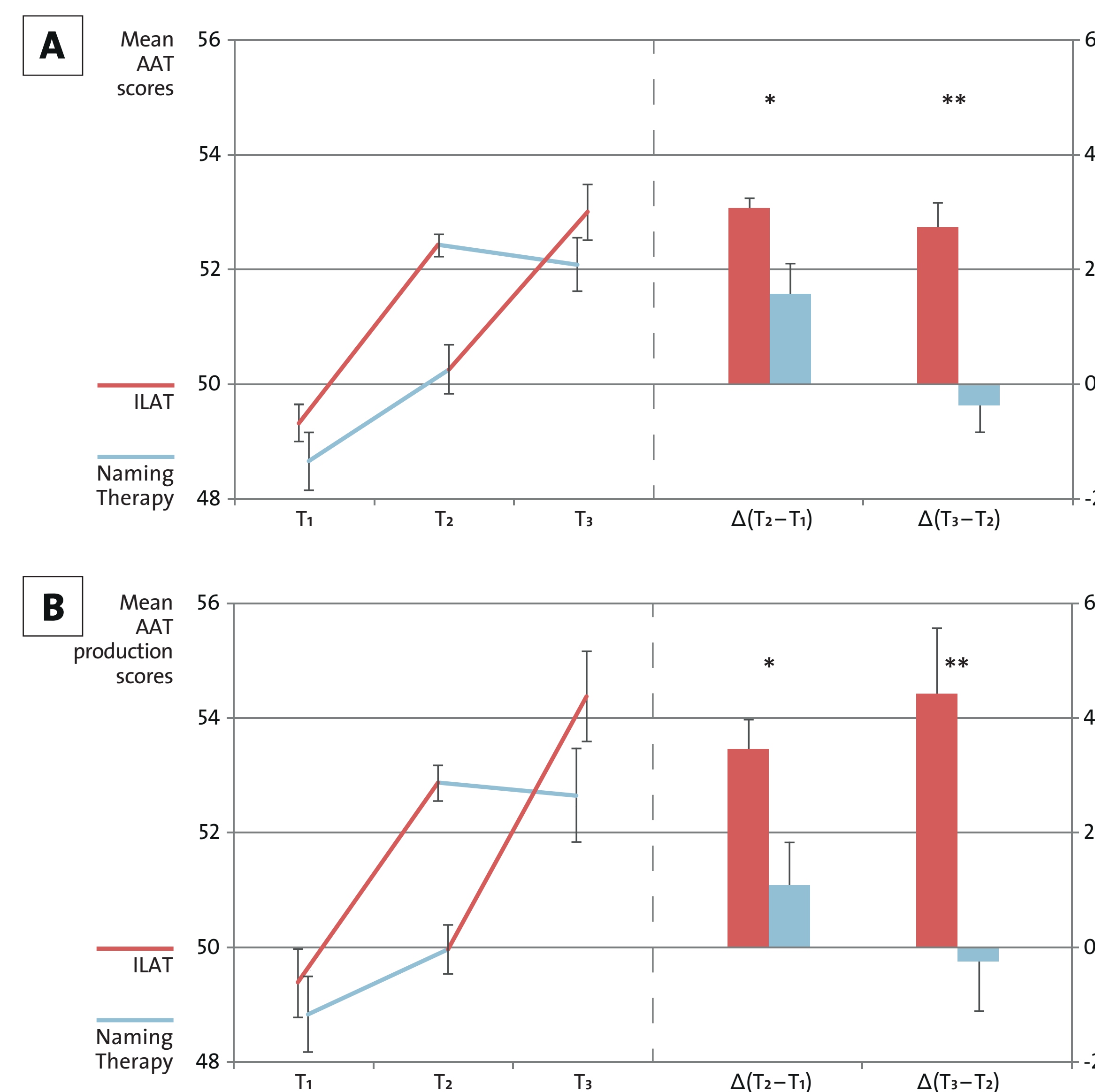
Eighteen individuals with left-hemisphere lesions and chronic non-fluent aphasia each received two types of training in counterbalanced order: (i) Intensive Language-Action Therapy (ILAT, an extended form of Constraint-Induced Aphasia Therapy; Difrancesco *et al.*, 2012) embedding verbal utterances in the context of communication and social interaction, and (ii) Naming Therapy focusing on speech production *per se*. Both types of training were delivered with the same high intensity (3.5 hours per therapy session) and duration (6 consecutive working days), with therapy materials and target utterances matched between treatment groups.



Study design. Group I received Intensive Language-Action Therapy (ILAT) prior to Naming Therapy, while Group II attended both types of training in reverse order. Patients underwent testing before treatment onset (T₁), after the first treatment (T₂), and after the second treatment (T₃).

3. Results

A standardized aphasia test battery (Aachen Aphasia Test) revealed significantly improved language performance with ILAT, independent of when this method was administered. In contrast, Naming Therapy tended to benefit language performance only when given at the onset of the treatment, but not when applied after previous intensive training (for details, see Stahl *et al.*, in press).



Aphasia test results. Changes in language performance on the Aachen Aphasia Test (AAT), based on mean scores across all subscales (Panel A) and speech production measures only (Panel B). Patients were randomly assigned to one of two Groups (Group I; Group II), each receiving Intensive Language-Action Therapy (ILAT) and Naming Therapy in counterbalanced order, and tested at

three points in Time (T₁; T₂; T₃). Repeated-measures analyses of variance revealed significant interactions of Time and Group on the mean AAT scores [$F(2, 30) = 6.91, p = 0.003$] and on the speech production measures [$F(2, 30) = 5.48, p = 0.009$]. Contrast analyses suggested significant interactions of Time and Group (* $p < 0.05$; ** $p < 0.01$) in both training periods (ΔT_2-T_1 ; ΔT_3-T_2).

4. Conclusions

The current results challenge the notion that massed practice alone promotes recovery from chronic post-stroke aphasia. Instead, our results demonstrate that using language for communication and social interaction increases the efficacy of intensive aphasia therapy. This particular benefit may arise from synergies in language-action circuits of the brain (Berthier & Pulvermüller, 2011) as well as from neural resources of everyday communication (Stahl & Van Lancker Sidtis, 2015).

References

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