

Addressing Tongue-Tie in Children with Autism Spectrum Disorder: Functional Outcomes of Orofacial Myofunctional Therapy Using Multimeasure Assessment

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Introduction

Ankyloglossia (tongue-tie) restricts tongue mobility and may contribute to feeding, airway issues such as chronic mouth breathing, low tongue posture, and articulation difficulties. In children with Autism Spectrum Disorder (ASD), overlapping oral-motor and sensory challenges—such as oral aversion to textured foods and heightened tactile sensitivities—can further complicate identification and management of tongue-tie. Although frenectomy is a common intervention, evidence supporting non-surgical, functional treatment approaches such as orofacial myofunctional therapy (OMT) remains limited in neurodiverse populations. This study examined whether targeted OMT could enhance tongue mobility, airway function, and speech articulation in children with ASD and mild to moderate tongue-tie.

Objective

To evaluate the effects of OMT on tongue mobility, articulation, and caregiver-reported feeding and airway outcomes in children with ASD and mild to moderate ankyloglossia using a multimodal assessment framework.

Methods

- Participants included children aged 4–8 years diagnosed with ASD and clinically confirmed mild to moderate tongue-tie.
- No frenectomy procedures were performed.
- Each child completed an individualized 8-week OMT program focusing on tongue elevation, dissociation, coordination, nasal breathing, and oral rest posture.
- Caregivers were trained to support daily home exercises.
- Outcome measures were collected at baseline, 1 month, 3 months, and 6 months post-intervention:
 - Tongue Range of Motion Ratio (TRMR)
 - Goldman–Fristoe Test of Articulation–3 (GFTA-3)
 - Tongue-Tie Questionnaire (TTQ/TRQ)

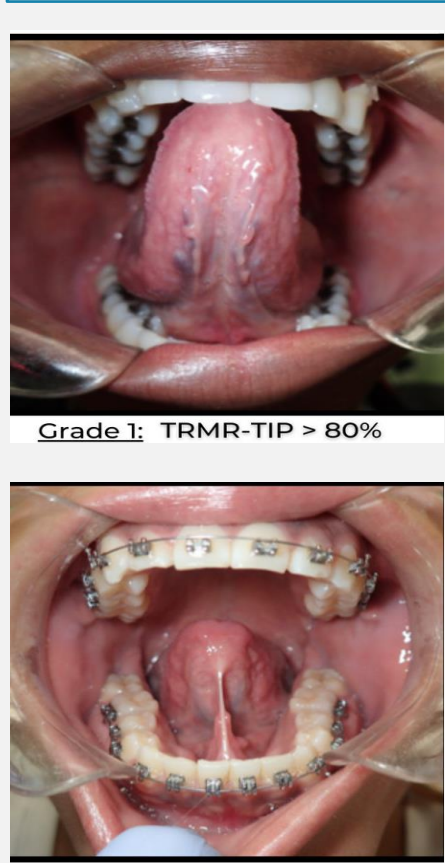


Figure 1. Functional Classification of Ankyloglossia Based on TRMR

Results

- TRMR demonstrated steady improvement following an 8-week OMT program, with continued gains through 6-month follow-up.
- GFTA-3 results indicated enhanced articulation precision, particularly with lingual sounds (/t/, /d/, /l/, /n/).
- TTQ/TRQ revealed improved feeding behaviors, reduced mouth breathing, and better oral rest posture.
- The greatest functional gains were associated with consistent attendance and caregiver engagement in home practice.

TRMR RESULTS FOR TONGUE MOBILITY

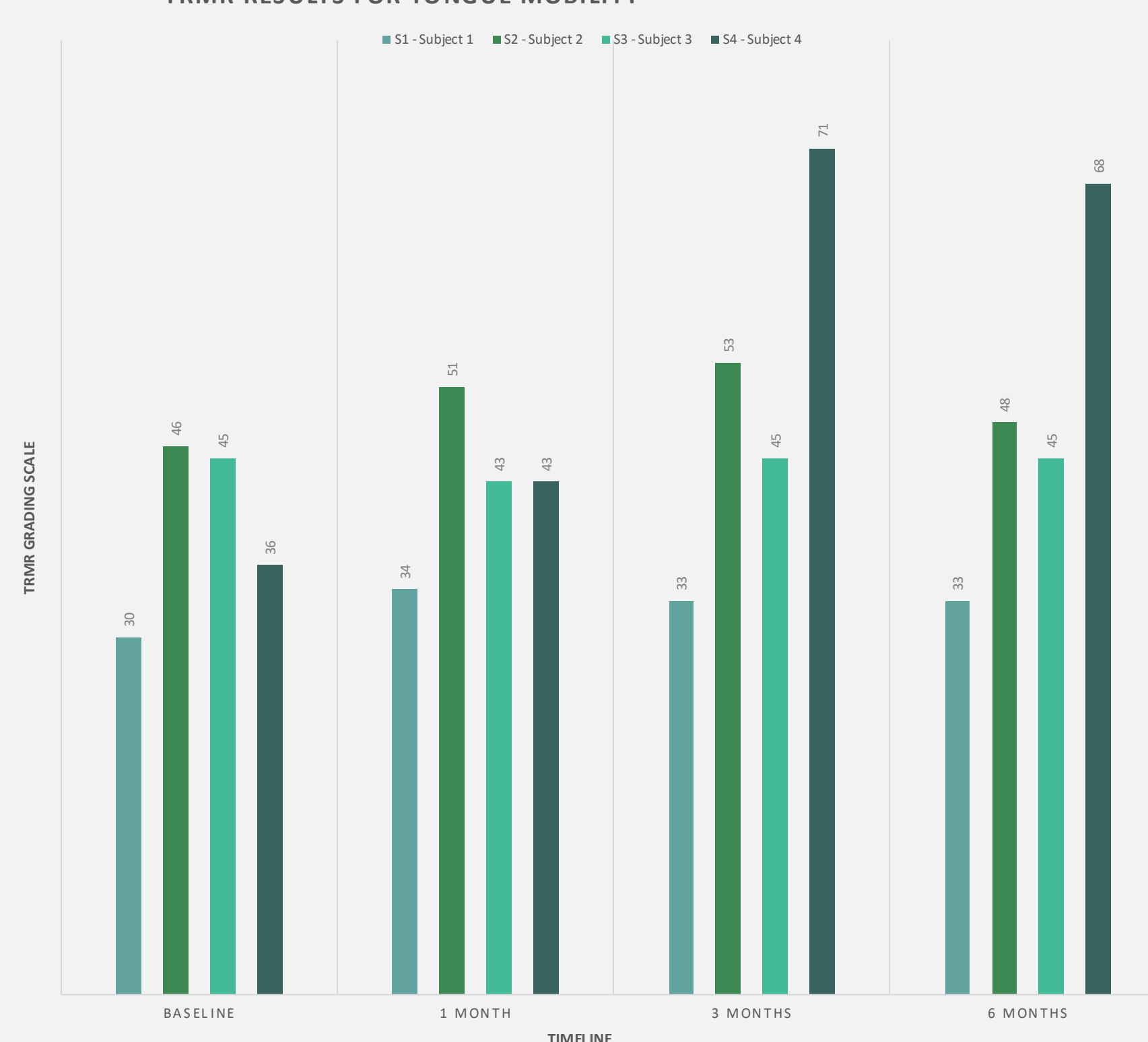


Chart 1 Participants demonstrated notable improvements in TRMR scores, reflecting increased tongue mobility.

- Grade 1: >80% (Normal)
- Grade 2: 50-80% (Mild Restriction)
- Grade 3: <50% (Moderate Restriction)
- Grade 4: <25% (Severe Restriction)

GFTA SCORES

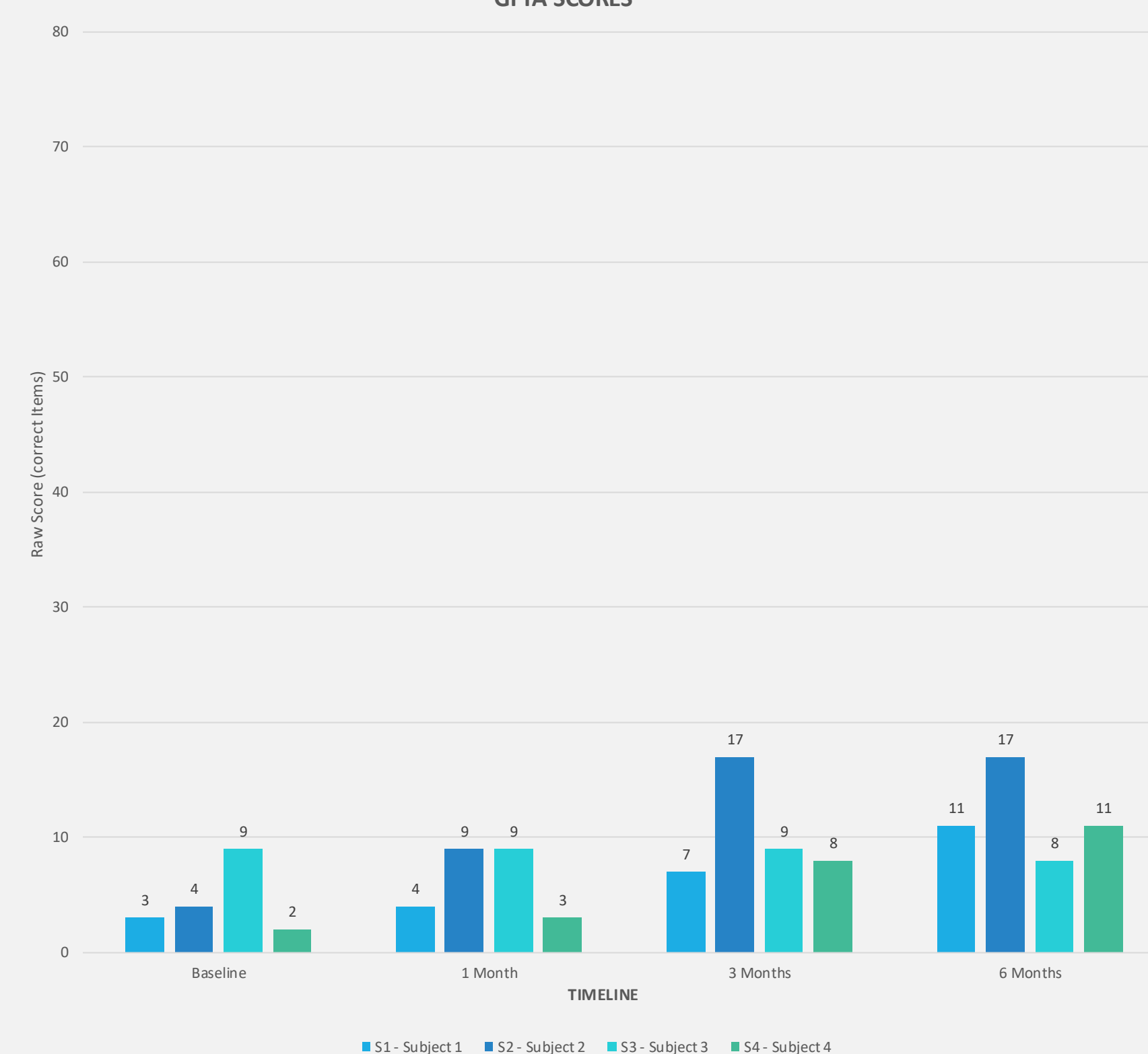


Chart 2. GFTA-3 scores reflected improved articulation accuracy in targeted Lingual-alveolar and lingual-palatal sounds following OMT.

Tongue Restriction Questionnaire (TRQ)

Name: _____ Gender: ____ Age: _____ Date: _____

Please check any issues that apply to help us determine if a tongue restriction may be present.

Current Issues

Frustration with communication

Trouble with speech sounds, hard to understand, or mumbling

Speech delay

Slow eater or trouble finishing a meal

Picky eater, especially with textures (e.g. meat, mashed potatoes)

Choking or gagging on liquids or foods

Spitting out food or packing food in cheeks

Restless sleep (kicking or moving while asleep)

Grinds teeth at night

Sleeps with mouth open

Snores (quiet or loud)

Jaw joint (TMJ) issues (popping, clicking, or pain)

Frequent headaches or neck pain

Mouth breathing during the day

Hyperactivity or inattention

How significantly do these issues impact quality of life?

Very Significantly Significantly Somewhat Not At All

To be Completed by Healthcare Provider

Tongue Elevation Exam: Grade 1 (>80%) / Grade 2 (50-80%) / Grade 3 (<50%) / Grade 4 (<25%)

Referral Recommended: YES / NO / MAYBE

Figure 2. TTQ/TRQ This form includes 15 items commonly related to tongue restrictions in infants to adults.

Discussion

- While frenectomy is frequently considered, there is limited evidence for conservative, non-surgical therapy approaches like OMT, particularly for mild to moderate cases.
- The positive outcomes suggest OMT can serve as an effective, non-surgical approach to addressing functional impairments associated with mild to moderate tongue-tie in children with ASD. Incorporating OMT into therapy protocols could improve feeding, airway function, and articulation outcomes while reducing the need for immediate surgical intervention.
- The study's small sample size limits generalizability, and longer-term follow-up is needed to determine sustainability of gains. Additionally, behavioral factors such as refusal linked to sensory processing challenges and heightened tactile sensitivity occasionally reduced participation, which may have limited outcome potential. Future work should use larger controlled cohorts, standardized outcome measures, and sensory-support strategies.

Conclusions

- Orofacial myofunctional therapy effectively improves tongue mobility, airway function, and speech articulation in children with ASD and mild to moderate tongue-tie without requiring surgical intervention.
- The combined use of TRMR, GFTA-3, and TTQ offers a comprehensive, evidence-based framework for monitoring progress and guiding treatment.
- These findings support OMT as a viable conservative approach for managing tongue-tie and associated airway and functional challenges in neurodiverse pediatric populations.

Keywords

Ankyloglossia, Autism Spectrum Disorder, Orofacial Myofunctional Therapy, Mild to Moderate Tongue-Tie, Mouth Breathing, TRMR, Goldman–Fristoe, Tongue-Tie Questionnaire, Feeding, Airway

References



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