A Meme's-Eye View of Nonspeech Oral-Motor Exercises

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ABSTRACT

The ideas motivating the use of nonspeech oral motor exercises (NSOMEs) cluster into three memeplexes that reflect the rich history of oral motor and nonspeech activities in speech-language pathology; a bottom-up, discrete skill theory of learning; and common treatment practices. The lack of clinical guidance provided by research also plays a role in the use of NSOMEs. The essence of the oral motor memeplex is the history of oral motor activities in speech-language pathology and the often detailed coverage these activities receive in the most widely read textbooks and publications in our profession. The essence of the discrete skill memeplex is that complex behaviors, like speech production, can be broken down into discrete sequences of processes and behaviors, and the best instruction and intervention involves discrete skills training, bottom-up approaches, task analyses, and developmentally sequenced materials. The clinical practice memeplex reflects a set of common clinical practices that contribute to the use of NSOMEs. These factors include the desire to provide state-of-the art treatment, a preference for broad-based, eclectic treatment approaches, and diverse and engaging activities that offer opportunities for measurable success. There are so many reasons to use NSOMEs that the more interesting question may be why some clinicians (< 15%) do *not* use these activities.

KEYWORDS: Meme, oral motor, learning, treatment

Learning Outcomes: As a result of this activity, the reader will be able to (1) define the terms *meme* and *memeplex* and explain their relevance to clinical beliefs and behaviors, (2) describe the historical contributions of clinical and educational practice to the current popularity of nonspeech oral motor exercises (NSOMEs), and (3) describe how a historical clinical emphasis on bottom-up, discrete skill theories of learning has affected the popularity of NSOMEs.

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A few years ago, I[1] questioned why auditory processing disorders and sensory integration disorders were more familiar to nonprofessionals than language or phonological disorders. The answer to this question required finding something that could explain situations in which the truth value of an idea was not the primary determinant of its use. That something is a *meme*, which is defined as an element of culture passed on by nongenetic means, especially by imitation, where imitation is broadly defined to include any kind of copying of ideas and behaviors from one person to another.[2,3] Tunes, ideas, catchphrases, ceremonies, and customs are all examples of memes. I was asked to contribute to this issue of *Seminars in Speech and Language* because the meme idea might explain the widespread use of nonspeech oral motor exercises (NSOMEs) for the treatment of children with speech sound disorders, despite the lack of evidence that these exercises have any direct impact on speech normalization. Although instructional activities and exercises do not appear to fit the criteria of a meme as a unit of cultural transmission, the ideas and theories that underlie and motivate these activities are good candidates for memes and memeplexes (i.e., memes that replicate together).

The ideas motivating the use of NSOMEs seem to cluster into three memeplexes that reflect the rich history of oral motor and nonspeech activities in speech-language pathology; a bottom-up, discrete skill theory of learning; and common treatment practices. The lack of clinical guidance provided by research also plays a role in the use of NSOMEs. In this article, I present the memeplexes for these factors and conclude with some thoughts about the continued use of NSOMEs for changing speech sound productions.

THE ORAL MOTOR MEMEPLEX

The essence of the oral motor memeplex is the history of oral motor activities in speech-language pathology and the often detailed coverage these activities receive in the most widely read textbooks and publications in our profession. From my viewpoint, five memes in this memeplex have to do with speech oral motor enhancement but not necessarily nonspeech oral motor exercises:

1. Targeting oral motor skills has a long history in speech-language pathology.
2. Oral motor activities are used with a variety of clients and disorders.
3. Oral motor activities are described in almost every textbook and general publication that discusses treatment for feeding, swallowing, motor speech, and craniofacial disorders.
4. Many publications pertaining to speech-sound disorders provide specific activities to improve oral motor skills associated with phoneme production.
5. Oral motor activities that directly facilitate speech may not be clearly differentiated from nonspeech oral motor activities.

The use of oral motor activities has been written about and used as a therapy technique since the inception of our field. Marshalla[4] recently examined the oral motor activities reported in 84 textbooks, clinical guidebooks, and conference proceedings. Among the interesting findings were that the term *oral motor* did not appear until a 1978 publication of the proceedings from a 4-day conference on oral motor function and dysfunction in children.[5] The focus of this conference was on feeding development and disorders, although there was one section on speech. Not one of the 84 publications reviewed used the term *NSOME* to identify oral (jaw, lip, tongue) motor (sensory, movement, and positioning) activities. These publications generally indicated a widespread acceptance of the use of oral motor techniques in feeding, dysphagia, motor speech, and craniofacial disorders. Clinicians who often have diverse caseloads (e.g., many children on the autism spectrum have feeding and swallowing problems) see the benefits of oral motor activities with individuals with these disorders and assume that these activities will also benefit children with speech sound disorders. Herein lies the controversy.

Publications in the first half of the 20th century, 1912 to 1956, advocated oral motor techniques and contained advice about their

selective application. They contained two types of methods:

1. Detailed methods designed to stimulate the movements and positions of the jaw, lips, and tongue for the production of specific phonemes. These methods became known as the "stimulus approach," the "phonetic placement approach," "motokinesthetics," and the "integral stimulation approach."[6]
2. Jaw, lip, and tongue warm-up activities designed to prepare the oral mechanism for speech sound movements. These methods were recommended for working with young children, older children with cognitive impairment or motor disability, and others who, for whatever reason, were not ready to work on one phoneme at a time.[4]

Later publications, from 1960 to 2007, continued to contain information about oral motor activities. Broad-based textbooks typically had cautionary information about the use of these techniques,[7,8] whereas some clinical guides had specific oral motor techniques while addressing a cross section of phonemes.[9,10] In these publications, a variety of terms and descriptive phrases were used to describe oral motor techniques.[4] Examples include "tongue exercises,"[11] "increasing the flexibility of the articulators,"[12] "tongue and lip awareness activities,"[7] and "extraoral and intraoral stimulation technique."[13] According to Marshalla,[4] none of these publications advocated using oral motor activities as a replacement for any aspect of articulation or phonology therapy, and many publications concerned with speech production discussed the use of these methods *within* a complete program of speech management.

Marshalla[4] suggests that a lack of organization and a misunderstanding of purpose and intent have caused the current confusion between the term *NSOMEs* and the classic perspective of oral motor therapy. A reader confronted with different sources will be exposed to hundreds of oral motor techniques, different terminologies for these techniques, and different suggestions about the disorders these techniques will help. Texts in articulation/phonological disorders may contain detailed information about facilitating oral and motor movements required for specific phonemes[14] or more general discussions of speech modification and shaping techniques to facilitate the production of various phonemes.[7,8] The distinction between speech-facilitating oral motor techniques and nonspeech oral motor techniques may not always be apparent. For example, when a tongue or lip movement is isolated from a sound production, does it become a nonspeech oral motor activity? And does a nonspeech activity like sticking out the tongue become a speech-facilitating oral motor activity when it is used to help a child produce a /ɜ/? The difficulty involved in distinguishing speech-facilitating and nonspeech oral motor activities may contribute to the use of NSOMEs by clinicians.

THE DISCRETE SKILL MEMEPLEX

The notion that complex behaviors should be divided into discrete skills for learning and instruction is an ongoing debate in the education field.[15] A discrete skills theory of learning has been called many things in the literature on instruction and intervention, including bottom-up, reductionist, mechanistic, Newtonian, fragmentary, and various combinations of these terms, such as bottom-up, discrete skill approach[16] and reductionist Newtonian mechanistic paradigm.[15] I've chosen to use the term *discrete skill* because it reflects the essential idea underlying instructional approaches that attempt to reduce complex behaviors to a series of discrete skills. The discrete skill memeplex contains two memes that reflect the discrete skill view on learning and instruction and three memes specific to speech development and oral motor skills. There are two versions of number 3 to reflect the views that normal speech develops from early oral motor behaviors or from discrete oral movements and two versions of number 5 because some people believe that oral motor activities can improve speech by themselves, whereas others believe that these activities can improve speech only if they are linked to speech sound productions.

1. Complex behaviors like speech production and language comprehension can be

broken down into discrete sequences of processes and behaviors.
2. The best instruction and intervention involves discrete skills training, bottom-up approaches, task analyses, and developmentally sequenced materials.
3a. Normal speech develops from early oral motor behaviors such as sucking and chewing.
3b. Normal speech develops from discrete oral movements of the tongue, lip, and jaw.
4. Children with speech delays have difficulty with discrete movements of the tongue, lip, and jaw.
5a. Improving discrete (isolated) movements of the tongue, lip, and jaw will lead to improved speech sound production.
5b. Improving discrete (isolated) movements of the tongue, lip, and jaw will lead to improved speech sound production if they are linked with specific speech sound productions.

The discrete theory of learning has as rich a history in speech-language pathology as the use of oral motor activities. Consider, for example, how common it is for speech-language pathologists to target auditory discrimination, sequencing, memory, and other non-speech-language skills in the treatment of individuals with speech and language disorders. The logic for these activities is that improving auditory discrimination, sequencing, or memory is necessary for improvements to occur in actual speech and language behaviors. The traditional Van Riper approach, for example, targets speech-sound discrimination before targeting speech-sound productions,[17] and auditory bombardment is the first component of Hodson and Paden's[18] popular cycles training. Speech sound discrimination and auditory bombardment activities are integral components of these popular treatment approaches, even though there is no evidence that these activities have a discernable impact on speech normalization.[16] Targeting non-speech oral motor skills is the most recent example of the impact and acceptance of the discrete skill theory of learning.

THE CLINICAL PRACTICE MEMEPLEX

The clinical practice memeplex reflects a set of common clinical practices that contribute to the use of NSOMEs. This memeplex is arguably the most questionable one because its five memes do not have to occur with one another. A clinician might prefer engaging activities, for example, but not be influenced by product marketing. Although the six memes listed next may not always co-occur, each of them can explain why a clinician might use NSOMEs without necessarily embracing the discrete skill perspective or being influenced by the history and widespread use of oral motor activities:

1. Desire to provide current, state-of-the art, popular treatment.
2. Preference for broad-based, eclectic treatment approaches.
3. Preference for diverse and engaging activities (e.g., games and toys) that offer opportunities for measurable success.
4. Willingness to try different treatment procedures for the nonresponsive client.
5. Clinicians (like all consumers) are influenced by promotional materials, advertising, convention exhibits, Web sites, and other sources that sell and promote oral motor activities.
6. Clinicians (like other practitioners) tend to place more value in personal clinical experiences and confirming research evidence than disconfirming research evidence.

Providing State-of-the Art Broad-Based Treatment

Since I entered in the profession in 1974, there have been changes in almost every aspect of how speech sound disorders are assessed, diagnosed, and treated with the exception of the actual procedures used to modify children's speech sound productions. How does a clinician appear up to date if he or she is using the same procedures and techniques to treat speech sound disorders as clinicians 50 years ago? Clinicians who want to appear up to date or innovative will look to provide services that have some unique component.

A treatment approach can appear to be unique if it combines treatment components in a novel way. Consider all of the components of treatment one can vary: (1) goal attack strategies used to target speech errors (horizontal, vertical, cyclical); (2) the specific aspects of the phonological system targeted (e.g., features, phonetic forms, phonemes, syllables, words, phonological processes/contrasts, phonotactic constraints); (3) behaviors and mechanisms that are considered to impact on speech production (speech perception/discrimination, language, phonological awareness, and nonspeech oral motor movements); and (4) treatment setting, frequency, duration, reinforcement schedule, participants, and so forth. Treatment approaches vary in how they "package" these different components. For example, Hodson and Paden's[18] cycles training combines elements of traditional speech therapy (motor placement) with a perceptual component, an efficient goal attack strategy (cycling), and phonological assessment. Although cycles training is often viewed as a phonological treatment approach, its appeal is the way it combines a phonological assessment with a cyclical goal-attack strategy, an auditory-perceptual component, traditional speech modification, and phonological awareness activities. Clinicians who wish to develop their own unique approach can create novel combinations of the various treatment components.

Adding NSOMEs to an existing treatment approach does not seem particularly controversial when it is viewed as simply another way to make a treatment approach unique or more broad based. Everything has its costs, however, and the cost of an "anything goes" combination of treatment components is not being able to determine the actual impact a treatment activity has on speech. This is best seen with the two most popular treatment approaches. Speech modification procedures are arguably the primary source of improved speech production in both the traditional and cycles approach. Auditory discrimination training, auditory bombardment, and cycles training only appear to be effective because they are combined with speech modification activities.

Diverse and Engaging Treatment Activities

A typical treatment session for children with speech sound disorders is 30 to 45 minutes. In some cases, sessions may last an hour. Although it is certainly possible to spend an entire session directly targeting speech production, few clients are able to tolerate working directly on speech sound production for 30 minutes or more. There are many speech-related activities to choose from, ranging from ones that focus on speech perception/discrimination and oral motor movements to those that target language and literacy skills such as phonological awareness.[7] A language-oriented clinician might target vocabulary development, conversational competency, emergent literacy skills, and other language-based skills. A broad-based eclectic clinician may combine aspects of the traditional approach with a cycles approach and also include oral motor exercises to make sure all bases are covered. Some clinicians might use nonspeech oral motor activities just to break the monotony of speech therapy and provide the child an opportunity to play with toys and games. Language-based activities have the obvious benefit of improving language and literacy skills, whereas success with other nonspeech activities (e.g., discrimination training and NSOMEs) may bolster a child's confidence to improve speech.

Treating the Noncompliant Client

Every clinician who has worked with a young child with a speech delay has experienced the frustration of not being able to modify or improve a child's speech productions. Some children don't like participating in therapy activities and often appear annoyed or frustrated with attempts to modify their speech.[4] I have written previously[19] about the difficulty clinicians experienced working with my daughter Franne, who had a moderate speech delay. The dilemma Franne presented for clinicians was that she would not "play" the therapy game, which is a nice way to say she resisted most attempts to modify or work on speech. She had no difficulty silently staring at clinicians until they gave up and did "something else" with her. For the doctoral students I

enlisted to work with Franne, this something else typically involved phoneme identification and receptive language-based activities that targeted sounds and words she had difficulty saying. Activities like these were consistent with my theoretical views of speech and language development, but given Franne's lack of responsiveness to treatment, I encouraged her clinicians to try anything within reason to improve her speech. This included activities that were inconsistent with my theoretical views and had little evidence to support their use.

Auditory bombardment was the questionable activity in this era (late 1980s). It was an integral component of Hodson and Paden's[18] cycles approach. Although I did not believe auditory bombardment had any impact on speech production, Barbara Hodson convinced me to at least try it. I brought home an auditory trainer one evening and bombarded Franne with sounds and words one evening and encouraged her clinicians to incorporate auditory bombardment in their treatment sessions whenever they wanted. In this spirit of "try any activity that might improve speech," I have no doubt that I would have encouraged Franne's clinicians to use NSOMEs, despite the questionable value of these activities for speech normalization.

The Marketing Influence

Publishing companies and individuals (e.g., Pam Marshalla and colleagues' Oral Motor Institute) that promote and market oral sensory and motor treatments also contribute to the widespread use of NSOMEs. A Google search revealed 869,000 hits for oral motor activities compared with 117,000 for auditory bombardment. The sites include not only personal Web sites, the Oral Motor Institute, and lists of activities, but companies that publish numerous materials (e.g., toys, games, books) to improve oral motor skills. Here is an example of one of the "Can Do" oral motor games published by Super Duper Publications (Greenville, SC).

"Oral-Motor excitement never ends with this action-packed 10 game board set. Themes include the Oral-Motor Castle, Manny's Lively Lips & Chubby's Cheeks, Tony and Tina's Tongue Aerobics, Ride the Oral-Motor Express, Manny's Mouth-Exercise, Strolling Down Lip Lane, Oral-Motor Magic, Tony and Tina's Tongue Time, Fun at the Oral-Motor Farm, and Run the Oral-Motor Mile! Your Set has: Ten game boards . . . [and] cute animal stand-up game pieces, die, and instructions."[20]

Clinicians are literally bombarded with brochures, e-mail, and conference exhibitors promoting their oral motor products and materials. Other controversial treatment activities (e.g., auditory discrimination training and auditory bombardment) do not have companies promoting and profiting from their use.

Clinical Experience versus Research Evidence

About 10 years ago, I wrote an article about factors that contribute to the selection of new treatment approaches.[21] In the article, I cited various sources suggesting that research was rarely a primary consideration in practitioners' selection of an instructional approach.[22] The most important factor in a practitioner's attitude toward change was whether a new instructional practice led to demonstrable gains in student achievement.[23] Although we might like to believe that the evidence-based practice era has made clinicians more responsive to research evidence, the fact that 85% of clinicians use NSOMEs to remediate speech sound production problems[24] suggests that practitioners today are just as influenced by behavioral change and other clinical factors as their predecessors 10 years ago.

It is not that clinicians do not value good clinical research. I think clinicians might be more likely to look to journals and research if the journals provided more guidance of what to do in therapy. A perusal of course syllabi or learner objectives of the latest workshops on speech sound disorders would give the impression that clinicians today are much more effective in treating speech sound disorders than our predecessors 20, 30, or 40 years ago. The reality, however, is that no evidence indicates that treatment approaches developed in the past 30 years are any more effective than those used back in the 1970s. Recent reviews of

treatment efficacy research[25,26] have found that different treatment approaches are not distinguishable in affecting change in a child's sound system. In other words, one treatment approach has not proven to be better than another.[26]

A meta-analysis of phonological treatment studies by Weston and Bain[27] confirmed how little guidance the existing research literature provides clinicians. These authors found 41 peer-reviewed intervention studies from 1960 to 2003 involving children with a primary diagnosis of a phonological disorder with or without an accompanying language disorder. The studies included descriptive and experimental designs but not case reports. These are the findings from the meta-analyses of these studies:

1. A paucity of research exists that provides clinicians with clinical directions.
2. The quality of intervention research was not at the more rigorous levels established in evidence-based practice hierarchies.
3. There was only one randomized clinical trial study.
4. Few studies investigated rate of phonological change.
5. Limited research exists about treatment outcomes.
6. Most studies focused on word-level productions and did not address more complex linguistic behaviors (e.g., conversation).

Based on these findings, Weston and Bain[27] concluded that "it would be difficult to establish 'best clinical practice' guidelines based on the existing research." So what is a clinician to do? Faced with the lack of guidance from research, it should not be surprising that clinicians embrace NSOMEs and other activities that may boost children's confidence and interest in speech. The benefits clinicians see in these activities make it unlikely they will be swayed by articles like the ones in this issue or the recent clinical forum in *Language, Speech, and Hearing Services in Schools.*[24,28,29]

SUMMARY AND CONCLUSIONS

When I began writing this article a couple of months ago, I wasn't quite sure how I would find enough to write about because I thought the discrete skill theory of learning and simplistic notions about the motoric underpinnings of speech development were the primary reasons for the widespread use of NSOMEs. As I began writing, however, I kept coming up with additional reasons for the use of NSOMEs that had nothing to do with a discrete skill theory of learning. These additional reasons clustered into two additional memeplexes, one involving the history of oral motor treatment and the other involving common clinical practices and views on research. As I found more and more reasons to explain the use of NSOMEs, I began to think that the more interesting question was to determine why a clinician is *not* using NSOMEs. The small percentage of clinicians ($< 15\%$) who do not use NSOMEs must strongly believe that these activities have absolutely no value for speech sound production. Someone needs to sample these clinicians to find out how they have been able to resist the allure of NSOMEs. The next step would be to recruit these "NSOME-resisters" to spearhead a practitioner-directed attack against the use NSOMEs to treat children with speech sound disorders. I hope that the guest editor of this issue will continue to lead us in the ongoing battle to reduce the widespread and indiscriminate use of NSOMEs.

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