OVERVIEW ARTICLE: USE OF EVIDENCE-BASED STRATEGIES IN CLINICAL PRACTICE TO IMPROVE SPEECH INTELLIGIBILITY IN ADULT CLIENTS

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Abstract

This article summarizes information contained in the book, *Improving Speech Intelligibility in Adults: Clinical Application of Evidence-Based Strategies*, authored by Connie Porcaro (Plural Publishing, Inc., 2023). For specific details on assessment and management of intelligibility as well as useful checklists and references, please refer to this book. Speech-language pathologists can have a significant impact on improving intelligibility in clients by teaching them strategies to provide useful information for communication partners. Speech-language pathologists should facilitate shared communication responsibilities by encouraging use of listener's strategies and for all involved in communication, to optimize the environment for optimum message sharing.

Keywords

intelligibility, comprehensibility, communication models, communication effectiveness, context cues, dysarthria management

Introduction to Intelligibility and Related Concepts

With many clients, the primary goal of a speech-language pathologist is to improve the ability to communicate effectively, ensuring messages are understood by communication partners. A key factor in this is intelligibility, which refers to how well a listener can understand a speaker's intended message (Duffy, 2019). Intelligibility issues can arise in clients of all ages and with various disorders, from childhood speech sound disorders to adult dysarthria. It is important to recognize that factors affecting intelligibility extend beyond the speaker's abilities. Environmental and listener-related factors can also influence communication (Yorkston et al., 1996). Addressing these elements is essential in the assessment and treatment of intelligibility impairments. This article examines how current research can guide the management of reduced intelligibility in adult clients, emphasizing strategies to improve communication across various contexts (Porcaro, 2023). The aim of this overview is to present factors that influence intelligibility, enabling clinicians to maximize their impact on improving communication skills in their clients and families.

Intelligibility refers to the extent to which a listener can understand the speaker's message based on the acoustic signal – the sounds produced by the speaker (Kent et al., 1989). It is influenced by the speaker's ability to produce speech sounds clearly, as well as any compensatory strategies they may use to enhance clarity. In treatment, the focus is on improving the listener's ability to recover the speaker's message from the speech signal.

In contrast, comprehensibility is a broader concept that includes not only the acoustic signal but also context-dependent information, such as shared knowledge or non-verbal cues, which help a listener understand the message (Yorkston et al., 1996). This can include understanding the topic of conversation or interpreting gestures. Comprehensibility combines intelligibility with contextual factors, often leading to better understanding than intelligibility alone.

Examining the components of a communicative exchange allows us to consider all the factors that might impact intelligibility. We often think of intelligibility as "belonging" to the speaker, but listener and environmental factors also play a role. To effectively assess and manage intelligibility, SLPs should consider all these factors.

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At its most basic level, communication involves one person sharing a vocal message with another. While this definition is a good starting point, communication models add components that represent a more complete exchange. This allows us to thoroughly examine all aspects of information exchange between clients and their communication partners for effective management.

Understanding different models of communication helps us grasp how information is exchanged effectively. Shannon and Weaver (1949) introduced the linear model of communication, where a sender transmits a message through a channel to a receiver, considering noise as a potential interference. Schramm (1954) expanded this with the interactional model, adding listener feedback and recognizing different fields of experience between speaker and listener. Barnlund's (2008) transactional model further evolved the concept by treating both parties as communicators who rapidly switch roles, emphasizing shared experiences for effective communication and acknowledging noise from various sources in the communication environment.

Communication breakdowns can occur at any of the levels previously described. For the most part, SLPs may tend to think about the breakdown occurring at the level of the speaker, since we are often working with clients who have a communication disorder. The listener could also be the source of an issue with communication. The listener may not receive the message, due to hearing impairment or mental distraction from the speaker's message. The communication environment also plays a role as background noise or other physical distractions can impact sharing of a message. Keep in mind that some of our clients are not able to physically change the way they communicate, including those who have neurological or structural damage, disease, or illness that impacts speech-related movements. For these clients, addressing all three areas, speaker, listener, and communication environment can be especially important.

Management Strategies Related to the Speaker

In an ideal world, techniques to reduce impact of speech impairments would allow effective communication. Besides focusing on the impairment, speakers can use compensatory strategies to participate actively in communication. Strategies can help listeners understand speakers with reduced intelligibility. Clinicians should consider clients' abilities and challenges to determine useful strategies. Those with moderate to severe intelligibility issues may need extra help, while those with mild issues may not. Clients with language or cognitive problems may struggle to learn and use these strategies.

Slowing speech rate can increase intelligibility, especially for clients with severe dysarthria (Yorkston et al., 1990). Pausing between words, including every syllable, and maintaining intonation may help (Clark, 2019). Clear speech directions, like over-enunciating or speaking as if to someone with hearing loss, can also improve intelligibility (Tjaden et al., 2014).

Speakers can modify messages to help listeners understand. Using complete, simple sentences and expected words can enhance comprehension. Predictable sentences result in higher intelligibility (Garcia & Cannito, 1996). Teaching clients to use predictable words and sentences helps listeners guess missing words. Keeping sentences related and informing listeners of topic changes improves understanding (Hustad & Beukelman, 2002).

Gaining the listener's attention before speaking is crucial. Verbal signals like saying the listener's name or nonverbal signals like touching or making eye contact can help (Clark, 2019). Setting ground rules for communication can make interactions smoother. Discussing how to indicate misunderstandings and agreeing on rules helps identify and repair communication breakdowns (Duffy, 2019). For severe intelligibility issues, focusing on conveying the meaning rather than understanding every word can be useful.

Speakers with reduced intelligibility can help listeners by providing topic cues, known as "semantic context." These cues allow listeners to predict what the speaker might say and rule out unexpected words. For example, pointing to a menu before discussing drinks helps listeners focus on expected words like "water" or "soda." Verbal cues like "I want to talk about our beach vacation" can lead listeners to think about related words like "ocean" or "sun." Context cues improve listeners' attitudes and understanding (Hustad & Gearhart, 2004).

Different cues may be used based on the needs of the speaker and the listener. These can be spoken, written, or visual, such as pointing to word lists, pictures, or items on a screen. Providing semantic cues improves intelligibility and comprehensibility for most clients as listeners are given more information to uncover the intended message. Signaling topic changes is crucial to avoid communication breakdowns. Speakers can use spoken, gestural, or written cues to indicate new topics. Clinicians should choose cues based on cognitive, pragmatic, and motor skills (Duffy, 2019).

Gestures can provide additional information beyond speech and improve understanding (Garcia & Cobb, 2000). Emblems convey meaning without words, like nodding emphatically to indicate agreement. Illustrators visually illustrate the message, like mimicking sleeping while saying "I'm tired." Gestures can improve intelligibility and may change the verbal message, increasing pitch and loudness. Clinicians should assess if gestures are beneficial for clients and utilize the ones that provide listeners with information.

Alphabet supplementation involves using a board with alphabet cues. Speakers can point to the first letter of each word while vocalizing, providing phonetic cues, and slowing speech rate. A systematic review by Hanson et al. (2004) shows alphabet boards improve word and sentence intelligibility, especially for those with severe impairment. Clinicians should consider each client's needs and abilities.

Maintaining eye contact helps monitor listener comprehension. Speakers can ask if the listener understood the message and identify any difficulties early in the conversation. This allows for effective repair strategies and reduces misunderstandings. Scheduling important conversations at a time free of distractions, in a quiet, well-lit environment, and ensuring the speaker's energy level is optimal can also help.

Communication breakdowns occur when the listener does not understand the speaker. These breakdowns may vary with different listeners or situations (Clark, 2019). Familiar partners might need different repair strategies than unfamiliar ones. Watching for signs of misunderstanding or asking the listener if they understood can help. Having a predetermined way to manage breakdowns is useful. To repair breakdowns, repeating the message exactly as stated initially is often the first step. If this does not work, rephrasing the message or using another word with a similar meaning might help. Describing a word can also be effective. For example, if "Uncle Ted" is not understood, describing him as "my mother's brother" might help. Advanced

planning, practice, and role modeling can be beneficial.

Combining strategies can be useful for many clients. Using multiple strategies, like clear, loud, and slow speech, can improve intelligibility. Determine which strategies work best for different listeners or environments and consider combining them for the best results.

Shared Communication Responsibilities

The ICF model (International Classification of Functioning, Disability and Health) (World Health Organization, 2001) encourages clinicians to look beyond speech subsystems and reduced intelligibility, focusing on how clients participate in meaningful life situations. Management of reduced intelligibility should involve anyone who participates in communication, not just the speakers. Communication is a two-way street involving both speaker and listener interactions. Olmstead et al. (2020) describe a process where SLPs consider contributions from both speakers and listeners, emphasizing their joint effort. "Listener" refers to someone actively participating in communication, not just hearing information. Shared responsibility can improve communication effectiveness (Yorkston et al., 1996). Communication partners may include family, friends, colleagues, and healthcare professionals. Each client's list of potential listeners will be unique and evolving.

"Intelligibility is as much in the ear of the listener as it is in the mouth of the speaker" (Weismer & Martin, 1992). Management should not focus solely on improving the speaker's abilities, especially for those who may not improve significantly. Working with communication partners to enhance message sharing is crucial. Listener strategies often involve common sense changes in interaction (Yorkston et al., 1996). Treatment is a partnership between speaker and listener, facilitated by the clinician. SLPs can teach both partners to use strategies in different situations.

Health care is increasingly emphasizing person- and family-centered care, which supports also family, friends, and caregivers in treatment. This approach involves joint effort in planning, delivery, and evaluation of clinical services, respecting the knowledge and experience of all involved (Baas, 2012). The goal is to help clients share feelings and information with important people in their lives. Participation by communication partners is critical.

Functional Listener Strategies

Average listeners can think at about 500 words per minute, while normal speech is 140 to 180 words per minute (McCoy et al., 2005). This gap can lead to daydreaming, so active listening is crucial. Extra processing time allows listeners to focus on additional cues from the speaker. SLPs can teach family members or caregivers active listening skills, like staying focused on the speaker and watching for cues.

Listeners should watch for signals that a conversation is starting in order to avoid missing information. They should also find out the topic of the conversation, either by asking the speaker or watching for topic changes. Being close to the speaker helps listeners see visual cues like gestures and facial expressions, which improve understanding (Keintz et al., 2007).

Using all available information, such as written text or pictures, can help listeners understand the spoken message. Listeners should maximize their own abilities, like using glasses or hearing aids if needed, to improve communication.

Listeners need to know how their partners want them to signal a communication breakdown (Clark, 2019). They can ask speakers to slow down or repeat words. Sharing what was not understood helps the speaker know what to clarify. Glossing, or repeating each word after the speaker, can be useful in high-feedback situations (Yorkston et al., 2004).

Providing feedback and encouragement is important. Both speakers and listeners should monitor communication for breakdowns and discuss what works and what does not. Encouragement helps keep communication partners from feeling frustrated (Duffy, 2019).

Strategies to Improve the Communication Environment

Beyond the behaviors of the speaker and listener, the ICF model (World Health Organization, 2001) reminds us to consider other factors that may influence communication. Environmental factors are external elements that can positively or negatively impact a person's interaction and performance (Threats, 2007). Personal factors, such as attitude, experiences, and education, also play a role.

Environmental factors can either facilitate or hinder a person's functioning (World Health Organization, 2001). Threats (2007) notes that removing barriers alone does not always improve functioning; we must also find ways to facilitate communication success. This includes considering the physical and social environments where clients communicate, such as home, school, workplace, and community settings. Contextual factors in the communicative environment can improve intelligibility and comprehensibility.

Noise in communication refers to anything that distracts from the message. Rothwell (2016) identifies four types of noise: physiological, psychological, semantic, and physical. Physiological noise involves physical impairments, psychological noise includes biases and assumptions about the speaker or message, semantic noise occurs when the speaker and listener do not share a language code, and physical noise involves external environmental factors. To reduce physiological noise, we can improve speech through subsystem approaches and use speaker and listener strategies previously discussed. Addressing psychological noise involves recognizing and mitigating biases. Reducing semantic noise can be achieved by providing context, gestures, or visual cues. Physical noise can sometimes be controlled by altering the environment, but when it cannot be controlled, adaptations and modifications can help improve communication. Reducing or eliminating background noise is crucial. Turn off TVs, radios, and noisy appliances (Yoho & Borrie, 2018; Duffy, 2019). Close doors and windows to block outside noise. In public places, choose quieter areas for communication.

Visual information from facial movements and gestures improves understanding (Keintz et al., 2007; Garcia & Cannito, 1996). Ensure good lighting and avoid backlighting to enhance visibility (Clark, 2019; Berry & Sanders, 1983). Avoid distractions during conversations. Visual distractions like phones or computer screens can hinder communication. Encourage clients and partners to focus solely on the conversation.

Speakers and listeners should stay close during conversations. Distance can reduce intelligibility, especially for speakers with speech disorders. ANSI standards suggest speakers should be within four feet of listeners in outdoor environments (Acoustic Society of America, 1977). Berry and Sanders (1983) emphasize the importance of proximity, which allows for better visual and auditory information to enhance listener understanding.

External aids can be helpful. Ensure hearing aids function properly. A client

may use amplification for certain events in noisy environments, but use of clear speech strategies is needed for effectiveness. Making an unintelligible exchange louder will not improve understanding unless the only issue is that the client's voice is difficult to hear.

Face masks can reduce intelligibility by muffling speech and blocking visual cues (Goldin et al., 2020). Encourage clients to use clear speech strategies to improve communication while wearing masks.

Using the phone wisely is important. Background noise, channel noise, and acoustic noise can degrade the speech signal (Skowronski & Harris, 2006). Remind clients to use phones in quiet environments to enhance intelligibility.

Summary

Speech-language pathologists play a crucial role in assisting clients with improving intelligibility. By teaching effective speaker strategies, SLPs enable clients to convey their messages more clearly, making it easier for listeners to understand. Clients can also provide context cues to add in understanding. It is important to recognize listeners as active communication partners who can also employ strategies to enhance the exchange of messages. SLPs should encourage both speakers and listeners to work together to optimize the communication environment, ensuring that interactions allow maximum exchange of information.

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