

أنواع والعوامل اللغوية المتمثلة في التأتأة وتأثيرها على تدفق إنتاج الكلام وفهمه

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الملخص

تتناول هذه الدراسة موضوع التأتأة وتأثيرها على الأفراد أثناء التحدث وفهم الكلام. للإجابة عن سؤالي البحث الرئيسيين:

1. ما أنواع اضطرابات الكلام التي يعاني منها المصابون بالتأتأة؟ 2. ما العوامل اللغوية التي تؤثر في إنتاج الكلام؟
تم اعتماد منهج يجمع بين نظرية جونسون وآخرين التشخيصية لعام 1959، وفرضية الإصلاح الخفي لبوستما وكولك عام 1993، ونظرية جوبتا الديناميكية الزمنية والمكانية لعام 2007، ونظرية وينغيت حول معالجة الكلام، لتوضيح كيفية تعطل طلاقة الكلام. أظهرت نتائج الدراسة أن كل فرد من المشاركين يعاني من التأتأة النمائية، والتي تتسم بالتكرار، وإطالة الأصوات (مثل "سسسماء")، والانحباسات، وتعديلات منتصف الكلمة، وهي مظاهر تبدأ غالباً في مرحلة الطفولة المبكرة وتستمر ما لم تُقدّم للمصاب جلسات علاجية. وقد زادت صعوبة التعبيرات وتسلسل الحروف الساكنة السريع من المشكلة، مما يتماشى مع تفسير جوبتا (2007) حول كيفية تعثر المتكلم عند مواجهة أمثلة كلامية معقدة. بالإضافة إلى ذلك، فإن المشكلات النحوية والمعجمية، إلى جانب زيادة مراقبة الذات أثناء الحديث، تداخلت مع طلاقة الكلام، مما أدى إلى زيادة التوقفات والتصحيحات أثناء الحديث. وتوصي الدراسة بأن تتضمن أفضل برامج التدخل لعلاج التأتأة دعماً لغوياً وإدارة للضغوط النفسية، بهدف التخفيف من هذه الصعوبات غير الضرورية.

الكلمات المفتاحية: علم النفس اللغوي، اضطراب الطلاقة، التأتأة، التأتأة النمائية، التعقيد اللغوي.

The Types and Linguistic Factors of Stuttering and Its Effect on The Flow of Speech Production and Understanding

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Abstract

This research looks into stuttering and how it influences people while speaking and understanding speech. To answer the two main research questions of (1) What are the types of disfluencies that a stutterer suffers from? (2) What are the linguistic factors which affect speech production? The approach combines Johnson & Associates' Diagnosogenic Theory from 1959, Postma & Kolk's Covert Repair Hypothesis from 1993, Gupta's Dynamic Temporal and Spatial Theory from 2007 and Wingate's Processing Theory to show disrupting speech fluency. The research showed that each individual in the study demonstrated developmental stuttering, marked by repetitions, sound lengthening ("sssssky"), blocks and mid-word edits which usually first develop in early childhood and carry on if therapy is not offered. Having to deal with difficult expressions and fast consonant sequences added to the problem, since this matches Gupta's (2007) explanation of how challenging speech examples can trip up a speaker. Besides, (more) grammatical and vocabulary issues, along with more self-monitoring interfered with speaking fluency, resulting in a rise in pauses and corrections. It is suggested that best stuttering interventions use both language help and stress management to handle these unnecessary difficulties.

Keywords: psycholinguistics, speech disfluency, stuttering, developmental stuttering, linguistic complexity

1. Introduction

Stuttering is a neurodevelopmental disorder characterized by disfluencies and involuntary interruptions in the normal flow of speech. It can have a significant effect on a person's capacity for effective communication, which can lead to isolation and loneliness. Individuals who stutter may encounter problems and difficulties in their communications with others. Stuttering may affect interpersonal communications, including social interactions and relationships. It may cause emotional and psychological consequences, such as anxiety, stress, depression and avoidance behaviors. The phenomenon of stuttering may fluctuate in different contexts e.g., speaking in public vs. casual conversation and this variability will affect speech flow. And this is the gap that the researcher tries to highlight in this study.

Some theories within psycholinguistics are introduced to explain stuttering. The "Diagnosogenic Theory" (Johnson & Associates, 1959) explains stuttering as coming from adverse reactions to normal speech ideologies, resulting in anxiety. The "Covert Repair Hypothesis" Postma & Kolk, 1993 proposes that stuttering emanates from the attempt by the brain to monitor and repair speech errors that can hamper speech planning. Whereas Gupta's "Dynamic Temporal and Spatial Theory" (2007) actually extends this by linking stuttering to timing and spatial in the planning of speech. Lastly, Wingate's "Processing Theory" (2012) attributes stuttering to the inability of fluent processing of commands, linguistic or motor. Combined with the above theories, the given set allows presenting the phenomenon of stuttering as a multiple factor issue that can be characterized by several distinctive aspects.

Consequently, few studies have highlighted how stuttering hinders the normal flow of speech in both the linguistic and social worlds. Unlike previous studies dysfluencies, behaviors or cognitive components were isolated and the current study investigated the interaction between them for the purpose of explaining how they interplay to limit fluent speech production in everyday communicative activities, providing theoretical and empirical implications. So that, the study addresses the following research questions:

1. What are the types of disfluencies that a stutterer suffers from?
2. What are the linguistic factors which affect speech production?

2. Literature Review

2.1 Overview of Psycholinguistics

Psycholinguistics focuses on the interaction of language and mind. It is the discipline that cuts across psychology and linguistics. Containing elements from psychology, cognitive science, as well as linguistics. Psycholinguistics studies the cognitive processes that are used while perceiving, producing or acquiring language. The field of psycholinguistics has developed a lot, and it has its own methods and theoretical approaches to investigate how people acquire and use language skills.

It also incorporates cultural considerations of languages since the study tries to show how language factors relate with psychological and social aspects, and how language can operate in various cultures (Jodai, 2011).

The phenomenon of stuttering is related to psycholinguistics, and it can be investigated from many perspectives and its causes viewed from the perspective of cognitive processes. Psychologists in this category will analyze methods that are followed in the storage, retrieval and utilization of language and in the different social and cultural circumstances. In this way, psycholinguistics contributes to filling the gap between language and the representation of the mechanism in the mind (Braun, 2007, Rastegari & Mek, 2008, Jodai, 2011). Psycholinguistics grants the researchers the possibility to investigate both the global and individual language-related mental phenomena which makes further development of the general concept of human language possible.

Psycholinguistics has a lot of points that is relevant to language acquisition and instruction, especially in the framework of English language learning and teaching. The field of Psycholinguistics offers constructive pedagogical theories expressed as approaches to language and gives basics of learning mechanism across the processes of acquisition storage and retrieval of data. Psycholinguistics' models such as the constrained processing model do help in the formulation of teaching approaches since they reveal how the learning process takes place in the learner's mind, and the potential difficulties involved. In this respect, psycholinguistics plays the role of making new teaching approaches, which consider the structure and function of language in the brain to help with learning in accordance with students' cognitive abilities (Eghlidi et al., 2017).

Contemporary grounded psycholinguistic research makes use of the technologies and experimental techniques that allow for studying language processing online. The present study uses methods that enable observation of cognitive processes that are associated with language production. These technologies have usefully informed the fields of study concerned with how people process and what they do with language in real use. Qualitative research strategies are also essential in studying the way that people interact with language at the semantic, discursive and rhetorical levels. However, some critics opine psycholinguistics may pay more attention to cognitive processes than pay attention to their sociocultural influences. This critique indicates the necessity of treating cognitive and sociocultural factors synchronously in investigation of psycholinguistic processes (Conklin & Guy, 2020; Tkachenko, 2023; Arulselvi, 2013).

2.2 Fluency Disorder: Stuttering

Stuttering as a categorical clinical speech disorder reflects trends in the understanding of the disorder considering contemporary theoretical models that derive from psychology of language, which stress the evidence of language encoding and production processes. This seems crucial periods in children's language development; therefore, the disorder is associated with cognitive functions of language.

It has been pointed out that in speech production participants who stutter experience disruptions during the encoding phase especially when faced with higher linguistic abilities (Ratner & Brundage, 2023). In addition, the stuttering events relate to larger and more complicated linguistic structures. As such, these findings stress the need to view stuttering as more than speech disorder but as a real cognition process which occurs due to the problem in the language formulation (Hategan et al., 2012).

Stuttering is one of the most complex examples of how high language and cognitive processes are interconnected. Stuttering is a speech disorder which can be defined as an interaction between linguistic and cognitive processes that hinder fluent speech. This implies that stuttering may arise where abilities related to higher order thinking and language functioning are expected, in an attempt to uncover the dissociation between what the speakers wished to pronounce and their inability to pronounce it smoothly. This phenomenon of stuttering can be described in terms of pauses, kind of repetitions, prolongations and blocks which indicate that speaker's output does not fully match with his/her intended plan. This is important to map the possible causes behind the deficit since there is a clear disconnect between the two.

In addition to speech disruptions to which everyone pays attention, participants with stuttering also express emotions and other cognitive processes that others cannot perceive. The results reveal that often, adults who stutter revealed their speech spoken with certain anticipations and loss of control over themselves, which causes them to have an intense emotional reaction (Tichenor & Yaruss, 2019). Such a qualitative experience requires a shift from a narrow, strictly clinical definition of stuttering that would encompass a range of experiences of individuals who stutter in addition to the physical discomfort they experience because of the disorder. Moreover, neuropathological data show that it is extremely unlikely that stuttering can be regarded only as a speech impairment, as there are certain cortical/subcortical networks linked with this disorder. Based on the identified peculiarities of stuttering and its multiple forms, it can be stated that the necessity of the individual and integral approach towards, as well as the multidimensional approach accepting both psycholinguistic factors and subjective experiences of stutterers (Ratner & Brundage, 2023).

2.3 Types of Stuttering

There are some classifications of stuttering, and each type is found to be associated with different psycholinguistic features. Knowledge of these types is important for planning intervention and treatment. In the subsequent sub-sections, the main, subsidiary, and other types of stuttering defiantly based on the psycholinguistic approach have been described.

2.3.1 Developmental Stuttering

Developmental stuttering appears as speech difficulties which cause interruptions during speech delivery in young children when their language skills undergo crucial development. The planning and execution of speech motor processes together with linguistic utterance encoding show association with stuttering problems according to psycholinguistic research (Smith & Weber, 2017). According to psycholinguistic models stuttering develops since cognitive and linguistic aspects of forming speech collide with the ability to produce speech at a normal pace. People who stutter typically face more difficulties when they try to retrieve words and build sentence structure because this leads to more disfluencies during speaking (Levelt, 1989).

The Covert Repair Hypothesis (Postma & Kolk, 1993) represents a main psycholinguistic theory describing stuttering through inner speech self-monitoring operations. This theory states that stuttering people identify phonological encoding mistakes more often than regular speakers, thus producing interrupted speech because they try to fix those mistakes. The hypothesis confirms previous research suggesting stuttering primarily affects complex linguistic words combined with demanding syntactical sentences since encoding mistakes become more likely (Howell & Au-Yeung, 2002). Experimental findings prove linguistic processing plays a determining role in the onset of stuttering together with its continuation.

The second research stream within psycholinguistics examines how working memory functions affect the development of developmental stuttering. Research shows that stuttering individuals usually possess diminished working memory capacity which interferes with their simultaneous execution of speech motor tasks alongside linguistic planning (Anderson & Wagovich, 2010). Stuttering may intensify the mental workload that occurs when producing speech especially while people need rapid access to words or need to construct complex sentences. Stuttering becomes more severe in circumstances where mental effort is high including time-limited tasks and situations involving social pressure.

The developmental condition of stuttering emerges from multiple factors that combine language skills with cognitive abilities together with motor function. Psycholinguistic investigations have helped scientists understand the structural elements that cause stuttering because they show how self-monitoring works with working memory and neural integration to produce speech. Researchers and clinicians can create specific intervention strategies which focus on linguistic and motoric processes of individuals who stutter by analyzing stuttering through psycholinguistic research methods. Future investigations into these interactions between language and speech skills must continue to enhance our knowledge of this intricate condition while developing better therapeutic practices.

2.3.2 Temporary Stuttering

Temporary stuttering occurs together with secondary behaviors and these phenomena reflect multiple internal linguistic and emotional as well as cognitive processes at work. People tend to develop additional behaviors like grimaces or movements and eye blinks when they notice their stuttering while dealing with the emotional discomfort (Wingate, 2012). The manifestations do not emerge from the core stuttering condition yet form because of emotional and psychological responses when someone experiences stuttering. When facing a stuttering moment an individual who stutters may start nodding their head frequently or stop looking at people directly to force their way through the disruption because they realize their disability and all related social pressures. The repetition of secondary behaviors during stuttering events eventually transforms into permanent speech patterns which increase the burden on the person who stutters in terms of their emotional state and social evaluations of their stuttering (Wingate, 2012).

Temporary stuttering evolves into secondary behaviors which transform stuttering into a disorder with increased psychological and emotional aspects. The article states that secondary behaviors emerge from the discomfort related to stuttering as adaptive responses which help control emotional and social aspects of conversation during speaking. When a stuttering child tries to handle their speech interruptions the child might develop excessive body movements and facial movements to conceal their stuttering. The behaviors start as voluntary actions, yet they transform into automatic habits resulting in difficulty for elimination unless a specific intervention approach is applied. The development of non-verbal mannerisms demonstrates the need to treat stuttering from both language-based and emotional and mental perspectives that lead to its continuance (Bloodstein & Ratner, 2008).

Temporary stuttering develops secondary behaviors because individuals become more aware of their speech problems and their impact on social situations. People who stutter increasingly develop secondary behavior patterns when they become aware of their stuttering due to anxiety and embarrassment and concern about negative judgment from others (Bloodstein & Ratner, 2008). A teenager who stutters will generally limit their exposure by refraining from particular words and scenarios because this is known as avoidance conditioning, and it deepens their stuttering habits. These social psychological emotional responses indicate the necessity of complete therapeutic models to support patients with speech difficulties and psychological distress.

2.3.3 Permanent Stuttering

Persistent developmental stuttering is known as permanent stuttering because neuropathological disorders within brain areas are responsible for speech and language functions. Medical studies confirm individuals with stuttering present different brain structures and functions in Broca's area and supplementary motor area (SMA) and basal ganglia (Brown et al., 2005).

Neuropathological irregularities cause disruptions to the exact speech timing needs which results in spoken repetition and prolongation and blockage problems characteristic of stuttering. Permanent stuttering presents as an enduring brain condition that differs from temporary stuttering since it establishes lasting neurological differences that need specialized therapies to treat it (Smith & Weber, 2017).

Among the permanent stuttering sub-types, the distinctive neurotic stuttering condition develops from environmental elements. children can develop stuttering after imitating stuttering speech patterns of family members or social contacts (Mandell 1930). They experience stuttering from a family member and can start showing disfluent speech cues by mimicking the stuttering patterns which result in neurotic stuttering. Neurotic stuttering develops through behavioral learning mechanisms through imitation whereas the natural neurological makeup of the brain does not cause this condition. Its root differs from neurogenic stuttering. This type of stuttering will slowly become a permanent part of speech when childhood exposure to stuttering persists without intervention.

Stuttering exists as a complex disorder which results from the interaction between neurological factors and environmental influences and developmental aspects. Neuropathological abnormalities create fundamental causes of permanent stuttering yet environmental influences through imitation and linguistic changes make it worse or make its symptoms mimic stuttering. Children who carry genes for stuttering tend to develop lasting stuttering when they receive imitative inputs or encounter serious linguistic obstacles (Yairi & Ambrose, 2005). The various elements that cause stuttering demonstrate the requirement for treatments that embrace different types of exposures to minimize permanent stuttering.

3. Research Methodology

This study employs a qualitative method to interview three typical stuttering cases in-depth. Johnson & Associates' Diagnosogenic Theory (1959), Postma & Kolk's Covert Repair Hypothesis (1993), Gupta's Dynamic Temporal and Spatial Theory (2007) and Wingate's Processing Theory all form part of the eclectic theoretical framework used at Johnson & Associates. Combining these models allows the analysis to understand how anxiety, self-monitoring and what others say affect a person's speech in a unified way. Themes are drawn from what participants share and from their actions to provide detailed insight into the range and outcomes of stuttering.

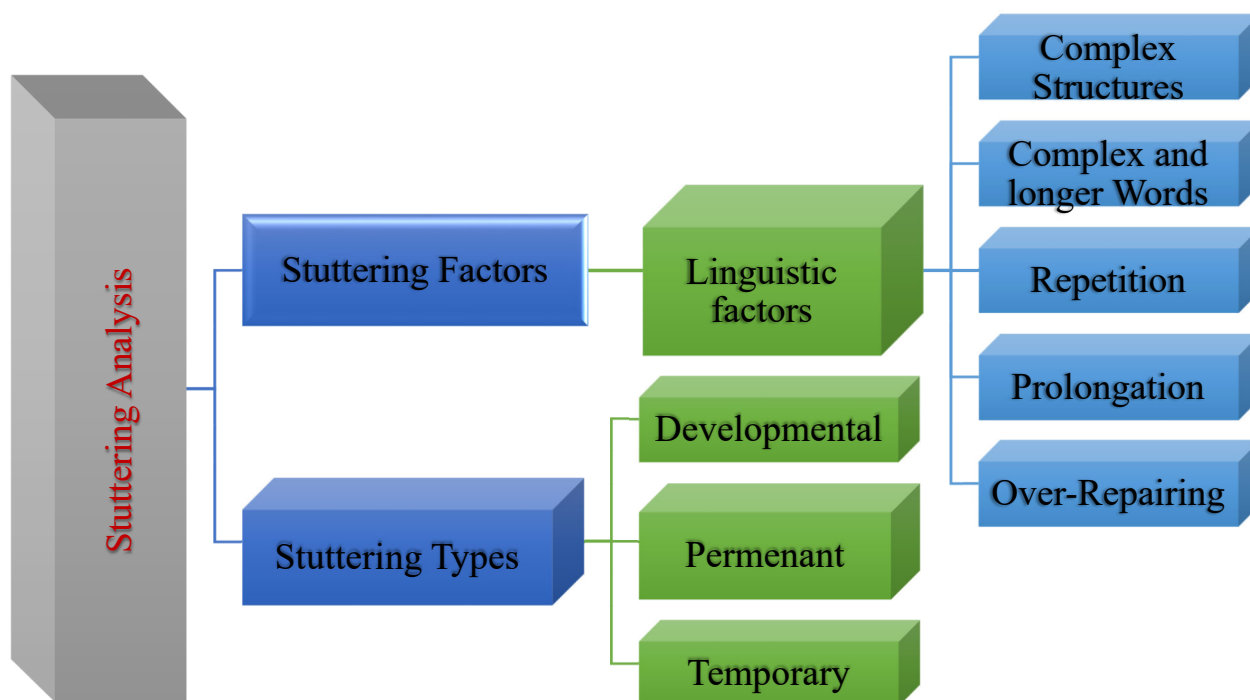


Fig (1) Model of Analysis

4. Data Analysis

Participant (1)

Type of Stuttering (Developmental Stuttering)

Responses to the questionnaire show that First Participant has traits in line with developmental stuttering. Children between ages 2 and 6 are usually affected and the condition will continue without treatment into adolescence or adulthood. Early signs are that I stuttered for over a decade, starting at age 5 and I was aware of my speech problems, struggled with complex language and had to focus on my speech skills instead of the message I was sharing. Not finding family history, self-esteem effects or triggers from the brain works well with developmental stuttering, as she also shows anxiety and struggles during speaking times. Socio-cultural problems may make her situation worse, but they do not cause the problem. Linguistic and cognitive difficulties involved in development usually cause speech planning to fail in people who stutter, as appears in her trouble with understanding and remembering words.

Linguistic Factors

1. complex structures

Many of the syntactic structures in the transcript difficulty one's fluency. When using several connected clauses together, it is necessary to plan language carefully and move the tongue accurately. To illustrate, the expression "After the sun sets, when a rosy glow is gone from the sky and shadows slowly grow in the forest..." features an introductory clause in the description. It is challenging for the speaker to use so many syllables, so she elongates the initial "s" and adds "-er-" into the phrase. In this case, "Similarly, the sentence 'The wise old Owl knew surely that arguing would be a waste of effort with the-uh- Grasshopper...' shows that the embedded clause makes the text choppy and repetitive." Because of these difficulties, people speaking broken English tend to use "uh," "um," and similar phrases to cover up their short-term memory problems.

2. complex and longer words

Having many syllables and sounding difficult a word makes a significant contributor to disfluencies. It is common for the speaker to stumble, repeat and stretch the sound of longer words with large groups of consonants. "Grassh---(block)----opper" is made from a compound and ends in a block because of the group of two consonants "ssh." The same happens in "ras---(block)----ping," since "sp" is a phonetically complicated part the speaker stumbles over and pauses. "Dis-dis-disturbed" and "p-p-p-punish" are hard for actors to pronounce because the parts with repeated letters require them to focus more on their movements. "The word "jjjjjoyous" makes use of prolongation because the speaker lengthens the "j" sound so they can pronounce the affricate consonant." It becomes clear that difficulties occurring in speech are more severe in sounds that are longer, have many consecutive consonants and change easily.

3. Repetition

There are many instances of repetition, and they involve repeating the sound, the syllable and the word. Repetitions of sounds appear very often on the soundtrack and are clearest on the initial consonant sounds (such as "during," "shadows," and "place"). The repeated words usually occur because the speaker is having trouble starting to speak certain words. Repeating the same syllable several times suggests that an individual finds it hard to switch between different sections of a word. Words that are repeated "if - if I- if I" or "Out po- Out popped" often appear when the child hesitates due to being nervous about what comes next. When dealing with words that are difficult for most to pronounce, repetitions are common and make clear their purpose as a strategy for coping with language challenges.

4. Prolongation

Prolongations allow a person time to prepare their words and vocal chords. The individual lengthens certain consonants as they go from one sound or syllable to the next. The syllable "ssss" in the word "ssssundown" makes the word sound stretching and smooth. Much like the first examples, in "sttttruck" the sound of the "t" is stretched out to fit in the "r," and in "mmmmmuch" the "m" is lengthened before the vowel.

The use of prolongations helps the speaker to flow and remain rhythmic before or at the start of a word, despite frequent disruption. Even though they block straight speech, they attempt to maintain control over what the person speaks.

5. Over-Repairing

During the transcript, speakers frequently corrected words they were saying in the middle, used many fillers and abandoned some expressions. Such attempts to deal with errors often lead to more disruptions in the text. For example:

During the utterance, the speaker changes “hol- old hollow tree” to “old hollow,” with a small pause in the middle. When someone inserts things like “-uh-” (“as she (pause) d-d-dozed away”) and stops briefly, they are indicating trouble with what to say next. A blocked portion causes the speaker to pause and say “tles,” making the flow even less easy. When arguing, it is possible to hear over-repair, as in: “Get away from h-h-here, sir!” because being excited increases our attention to others. Such language demonstrates that the speaker is aware of their barking voice and tries to ease it, although the attempts have only limited success.

Participant (2)

Type of Stuttering (Developmental Stuttering)

Based on the survey results, Participant (2) matches developmental stuttering the most and his problem is increased by both cultural and psychological factors. It’s typical for children to start stuttering at ages 2–6, yet participant’s onset at age 8 suggests his case was not the usual developmental type.

Linguistic Factors

1. complex structures

The sentences in the transcript involve different clauses and additional notes that make them complex for easy speech. Therefore, the part “Th–th–then after sundown, w–w–when the rosy light fades and the shadows rise slo-slo-slowly through the wood...” uses a temporal clause and finishes with a coordinate clause. Since these forms require careful word choice and continuous understanding of the topic, they weaken the speaker’s fluency. Because the sentence is difficult for him, the participant describes it slowly, repeating “slo-slo-slowly” and stretching out “sssssky”. Just as before, where the phrase “The w-wise old Owl knew quite well that...” uses repetitions around the word “Know,” the sentence “The w-wise old Owl knew that it would do no good to -uh-argue with the G-g-grasshopper...” has “G-grasshopper” repeated three times, with additional fillers at the beginning. Due to the complexity of their sentence structure, speakers often say things in parts and include words or phrases that do not make sense when planning what to say.

2. complex and longer words

There are usually more disfluencies with words whose pronunciation contains more syllables or sounds. Long and difficult words cause the speaker to have blocks, repeat sounds and prolong some speech sounds. Essentially, the fact that “Gra-gra-gra-grasshopper” is a compound and includes a repetitive cluster of consonants causes the speaker to try and start saying it several times. In both examples, there is an obstacle stopping the speaker from smoothly connecting “j” to “oy” for joy and “s” to “r” for deserved. There is difficulty in saying words like “af-af-afternoon” and “p-p-permit”, as the repetitions tend to cluster in places of the word that are most difficult to pronounce. This shows that speech disruptions become greater when the language involves long syllables, big clusters of consonants and changes in how vowels and consonants are pronounced.

3. Repetition

Connectives mostly occur as repeats of a sound, syllable or word. When looking at the transcript, you will notice that “w,” “b,” and “p” show up twice in several words (e.g., “w-w-when,” “b-b-b-bugs,” “p-p-place”). Because of these sounds, individuals can have difficulties beginning their words during speech. When a word like “ruff-ruf-ruff-ler” is used, it demonstrates trouble changing from one syllable to the next. Repetitions of whole words, for example “Out-out popped” and “mice-mice,” indicate that the speaker is pausing in the middle of a sentence due to being anxious about the sounds or structures ahead. Repeating certain words gives learners a chance to successfully express themselves when they are not sure how to use a certain language element.

4. Prolongation

Making an extended sound or syllable gives individuals time to assemble the right articulators for more complex words. The speaker lengthens some consonants as they passage from one sound or syllable to the next. You can see this by listening to “sssssky.” The last “s” is held longer than usual and moves into the vowel on its own rhythm. Also, the increase in “rrrr” and “mmmm” in these words helps the artist maintain breathing and deal with the many different sounds in each transition. When a speaker has disfluencies, they use prolongations before certain sounds and at the beginning of words to maintain the rhythm. These disruptions in speech occur because people are trying to maintain control over what they say.

5. Over-Repairing

Throughout the text, the student uses mid-word corrections, fillers and abandons what he was trying to communicate. Such repairs happen intentionally, but they sometimes make the speech even more choppy. For example:

Mid-word adjustments: This happens when the speaker skips over “cro---(block)---ss” and begins again with the word “ha-ha-hard.”

A sign of awkward speech is inserting sounds like “-um-” (“if anything (diapause) awakened the Owl”) or pausing (“if something in particular happened to the Owl”).

A word lopped off: “Anysoun---(block)----ody” requires the speaker to repeat “ody” and causes additional interruption.

It is noticeable when people use dialogic exchanges, since strong emotions can lead them to monitor themselves more carefully. These actions reveal that the speaker is aware of how they struggle with speech and tries, as best they can, to make their speech easier to understand.

Participant (3)

Type of Stuttering (Developmental Stuttering)

According to what Participant (3) said in the survey, he displays changes of development stuttering, possibly influenced by genetics because of his family situation (Q6). Although developmental stuttering usually appears in kids between age 2 and age 6, participant (3) developed it at age 10 which can be either because his presentation was very mild or he developed it later than others with this condition.

Linguistic Factors

1. Complex structures

There are complex sentences and multi-layered phrases in the transcript that are hard to speak out loud without stuttering. “After sundown, when the rosy light goes away, the shadows come gently up throughout the forest...” has both a temporal clause and a coordinate clause. They require extra planning with language and seamless changes between subjects which challenges a person’s speech fluency. Having to manage these complicated phrases causes the participant to make repetitions (e.g., “fades, fades, fades”) and take breaks before moving on. Here, too, the phrase “The wise-um- old Owl understood -um-quite clearly that arguing wouldn’t (pause) be a good idea...” explains that language can be both clever and creative through simple repetitions and filled pauses. Such disturbances prove that creating speech from intricate sentences is hard which leads the speaker to interrupt the sentence or insert hiccups.

2. complex and longer words

Long colorful words can make it challenging for people to speak easily. When speaking phonetically difficult words, the participant meets blocks, repeats sections and prolongs sounds. Let’s take “qu---(block)----iet” and “slu---(block)----mbers” as examples. The “qu” is being blocked by the following “ie” for the former and “sl” is blocked by “m” in the latter. When a speaker says “joy-joy-joyous,” the repetition happens because it is hard to coordinately move their mouth and throat for these kinds of words. Also, words that are combinations of smaller words such as “Grasshopper” (written as “he---(block)----ad”), become separated into blocks because they are harder to pronounce. They show that speech difficulties are often caused by certain language features such as making many demands on the speech motor system.

3. Repetition

Repetitions occur when a sound, a syllable or a word is repeated. It can be seen that many of the errors are made in the transcript for initial consonants, reflecting that she finds it difficult to begin speaking. The fact that “ho-ho-hollow” and “sha-sha-shadows” have repeating syllables means it’s hard for the reader to transition from one syllable to the next within those words. Word pairs such as “she likes, she likes” and “But-but” demonstrate that the individual is breaking up these phrases because they are anxious about what is about to happen next. Confusing or unknown words are often repeated to lessen the children’s confusion. Here, repeating the word “den in the old oak ttttree” demonstrates that he repeats the same sound to overcome the difficult “tr” cluster in the word “tree.”

4. Prolongation

Using this technique, people help themselves by delaying the production of some sounds or syllables. The speaker prolongs certain consonants to ease the change from one word to the next in “sssssun” and “rrrruffling.” Likewise, words such as “bbbbegins” and “pun---(block)----ish” involve lengthy sounds to help with how smoothly the speaker can pronounce them. Speakers may use prolongations in the beginning of a word or just before a difficult group of sounds like “rasping” so they can continue speaking easily as they prepare to say the next part of what they want to say. Although these extensions cause some disruption in speech, they usually occur as the brain struggles to direct the way speech is produced in intense situations.

5. Over-Repairing

When people correct in the middle of a word, add filler sounds or abandon parts of an utterance, it commonly increases their struggles with speech disfluencies. As the speaker sees their mistakes, they keep interrupting to correct themselves using “he---(block)----ad” and “answ---(block)----ered” as examples. Moments when listeners hear “-um-” (“wise-um- old Owl”), pauses (“laid (pause) as side”) and repetitions (“not-not sharp”) indicate the character is pausing, not sure of what to say or trying to correct themselves. Quite often, individuals with OCD use the same lines or words over and over again when they feel strongly negative emotions during conversations which in turn makes them pay closer attention to their own actions. They indicate that the speaker is highly alert to these PA mistakes yet that the solutions sometimes make the PA issues stand out even more.

4.1 Discussion and Results

An examination of the cases of three participants with developmental stuttering suggests that something similar underlies the language and emotional aspects of their disruptions. All of the participants had more disruptions, repeated themselves, blocked and stretched sentences when handling challenging grammar or tricky words.

The complexity of language used during speech caused the person's brain to have difficulty coordinating and planning the needed movements, as expected from the Gupta's Dynamic Temporal-Spatial Theory of stuttering (2007). These two strategies became necessary to manage switches between syllables, but they frequently increased stuttering due to Postma & Kolk's Covert Repair Hypothesis (1993) claim that over-monitoring makes fluency less reliable. Participants displaying a lot of over-repairs (e.g., pausing, restarts, adding "-um-" in the middle of a word) showed higher anxiety and were more aware of their stuttering which is what Johnson's theory (1959) predicts. Although Participant 3 began with ASD at age 10 and their family history pointed to unusual routes of development, there were strong links found in every case between memory problems and social-emotional challenges. The results show that stuttering results from a mix of speaking issues, physical control problems and pressures people feel around speaking, making it important to help in both speech and psychological areas.

5. Conclusions

The study reaches the following conclusions:

1. The research examined developmental stuttering which often starts in early childhood (at ages 2–6) and may continue into adolescence or adulthood without treatment. Developmental stuttering was shown by all three participants in the form of repetitions, lengthened sounds (e.g., "sssssky"), blocks and frequent mid-word corrections. Though the data did not separate permanent from temporary stuttering, it became clear from participant examples that developmental stuttering tends to stay intact for years. Their atypical start to symptoms at age 10 and a family background made genetic issues possible, but the symptoms still showed the same developmental changes usual to some cases. Because no participants had just temporary stuttering, the study looks at long-term issues rather than brief speech disruptions.
2. Complexity in language caused difficulty in speaking for all participants. Using many clauses in sentences ("When it becomes night and everything becomes less red...") and struggles to plan speech become noticeable, leading to recurring words and plenty of pauses. Trouble with certain words that have consonant clusters or are spelled with multiple syllables—for example, "block" from "Grasshopper" or "tripping" over the word "afternoon"—meant my brain struggled to coordinate the actions and slowed me down. These findings are consistent with Gupta's Dynamic Temporal-Spatial Theory (2007), with temporal-spatial differences during speech planning making communication problems worse. On top of that, struggling with complex grammar and difficult vocabulary, in addition to keeping an anxious eye on what's being said (as Postma & Kolk suggest), added to the distractions. Both fillers and mid-word corrections indicated how the demands of thinking and speaking as well as emotion added up to affect speech in people with developmental stuttering. Treatments ought to include work on language support and ways to decrease stress to counter these issues.

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