Research Article

Comparison of Fluency Characteristics in News-readers and Controls

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Liji Antony, Vani Latha and Yelimeli V. Geetha

Affiliations

All India Institute of Speech and Hearing, Manasagangothri, Mysore, 570 006

Corresponding Author

Liji Antony
All India Institute of Speech and Hearing, Manasagangotri, Mysore
Email: antonylusvin@gmail.com

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Abstract

Presentation expertise is an essential characteristic of a successful news-reader. The study aimed to investigate the fluency characteristics like continuity, rate and speech naturalness in TV newscasters and control speakers. The participants included 10 (8 females and 2 males) news readers within the age-range of 25-35 years and 10 age and gender matched controls. Spontaneous speech and reading samples of the participants were audio recorded and analysed for type and percentage of disfluencies, rate of spontaneous speech and reading and speech naturalness. Three post-graduate speech language pathologists rated the speech samples for naturalness using Multidimensional Speech Naturalness scale (Kanchan & Savithri, 1997). The percentage of disfluencies was higher in control group as compared to news readers both in reading as well as in spontaneous speech tasks. The news readers exhibited normal disfluencies like interjections, pauses, revisions, word fillers, phrase repetitions and whole word repetitions while the normal group in addition showed revisions and word fillers as well as occasional stuttering like disfluencies (SLDs) like part word repetitions, sound repetitions and prolongations. Significant difference in spontaneous speaking rate was evidenced between the two groups, but no significant difference in reading rate was noticed between news readers and controls. Overall naturalness of the spontaneous speech as well as reading samples was dependent on the groups. Hence, the professional news readers differed from the normals in terms of types and percentage of disfluencies, speaking rate and naturalness characteristics.

Introduction

Communication is an important and very essential component of human existence and speech is one of the main avenues of communication. Human beings begin to learn the art of communication through speech during the early childhood, which is constantly refined in many different ways for its effectiveness. Fluent speech necessitates good timing parameters such as continuity, rate, rhythm and prosody and should be effortless. Depending on the context of communication, most typically speaking individuals exhibit normal non-fluencies like hesitations, pauses (both audible and inaudible), word/phrase repetitions and revisions which are largely due to the language formulation difficulties.

Professional communication involves using speech for professional purposes like those by teachers, lawyers, public speakers, and Radio/ TV broadcasters, who are required to speak fluently and effectively. Presentation expertise, determined mainly by the presence of knowledge base, language proficiency, fluent speaking, mastery of multitasking, interviewing finesse, ability to process new information and sense of timing is an inevitable requisite to be a successful professional speaker.

A news presenter commonly known as a newsreader is a qualified professional who presents news during a news program on television, radio or on the internet. Although few literature regarding the prosodic and voice characteristics of news readers exist, no studies pertaining to the fluency characteristics of news readers have been reported. This information will provide an insight into the expertise required in the field of broadcasting, along with delivering assistance in developing effective education strategies for journalism students (Neil, Worrall, Day & Hickson, 2003).

Speaking/reading fluency is one of the inevitable characteristic of a news reader. Starkweather (1987) describes speech fluency in terms of timing parameters (continuity, rate, duration) and effort (physical and mental). Disruption in any one of these parameters that defines fluency

can result in disfluent speech. Disfluencies refer to breaks that are normal, abnormal, or ambiguous (i.e., sometimes regarded as normal and sometimes abnormal). All typical speakers experience disruptions in their fluency that are considered normal. These fluency breaks can be termed as normal non-fluencies or disfluencies. The most commonly regarded normal non-fluencies as reported by Yairi and Ambrose (1999) include hesitations or long pauses for language formulation (e.g. "This is our [pause] miscellaneous group"), word fillers (e.g., "The color is like red"), also known as "filled pauses", non-word fillers (sometimes called interjections, e.g., "The color is uh red"), phrase repetitions (e.g., "This is a-this is a problem"), and revisions/abandoned utterances ("Mom ate/ Mom fixed dinner", "I want/Hey look at that"). A vital documented characteristic of good news readers is the absence of mispronunciations or discontinuities called "fluffs" (Herbert, 1977; Masterton & Patching, 1990; Miles, 1975). In an analysis of speaking and reading samples from professional newsreaders, student news readers and controls, Neil, Worrall, Day and Hickson (2003) concluded that the professional news reading group made significantly fewer pronunciation errors than both the student and control groups. Mispronunciations and other fluffs like hesitating and stumbling over words may adversely affect newsreader's credibility.

Speech rate is another imperative element in news presentation. It is one of the most substantial fundamentals that determine the clarity and intelligibility as well as the listener's understanding of the broad casted matter, especially in news programs. A faster speaking rate not only makes the speech unintelligible, but also makes it less influential. Thus, appropriate speech rate is an indispensable requisite in news presentation, more than in an entertainment program, because a lot of information is delivered to the listeners, within a brief period of time. Faster speech rate prevents the listener from assimilating the information (McGurk & Mac Donald, 1976; Campanella & Belin, 2007). Viewers need time to retain the information in their memory without a second opportunity. Hence, comprehension becomes demanding if many words are spoken over a short time span (Berlyne, 1960). A slow speech rate with pauses allows a listener extra time for speech processing (Murphey, Carol, Dobie & Grant, 2003). If the speech rate is markedly slow, the listener's attention may be adversely affected. "In broadcasting, control of rate is important and reveals your sense of involvement and interest in a story" (Utterback, 2000). A presentation that unfolds at a very slow pace can lead to it being difficult to maintain attention effectively (Berlyne, 1960) and can result in weakened comprehension (Mastropieri, Leinart & Scruggs, 1999), because an increase in the flow of information can raise attention and learning (LaBarbera & Mac Lachlan 1979).

Accurate reading pace should be the one that is comfortable for the reader and clear to the listener. Most authors recommend a speech rate between 160 and 180 words per minute (wpm) for radio broadcasting. Borden (1927) established an average rate of 165 wpm, and remarked that the delivery should comprise marked variations in rate. Lawton (1930) analysed students' listening to radio speakers and reported that in 34 cases the speakers delivered the message too swiftly to be understood, while in 12 delivery was too slow, therefore lacked interest. 120, 124, and 128 wpm were the speech rates considered slow, whereas 135 to 140 wpm was regarded an appropriate delivery rate. According to Lumley and Frederick (1933), the average rate was 240 syllables per minute or 160 words per minute. Tauroza and Allison (1990) analysed the news conveyance rate on BBC Radio, and recorded a reading rate between 150 and 170 wpm, which reinforce the findings of Pimsleur, Paul, Hancock and Furey (1977) who recorded a delivery rate between 160 and 190 wpm for English and French radio news readers. Boyd (2003) establishes the rate between 140 and 220 wpm, even though he considers 180 wpm to be the most accepted rate. The typical reading rate on radio is three words a second (Chantler & Stewart, 2003). In Spanish radio news, an increased rate of around 200 wpm is used in all radio stations (Rodero, 2007). Kendall (2009) reported a speech rate of 5.34 syllables per second for radio interviews. It is essential to consider this aspect because recall and recognition of the message can be affected by speech rate (Meyerson, 1974; Goldhaber, 1974; Murphey, Carol, Dobie & Grant, 2003).

Comparison of speech rate between professional newsreaders, student newsreaders and controls by Neil, Worrall, Day and Hickson (2003) revealed that the professional newsreaders were found to speak significantly faster than their controls and the student newsreaders had a mean rate of 182.2 wpm. Mok, Fung and Li (2014) compared the speech rate of eight Hong Kong professional TV news anchors, and eight university students and reported that the news anchors spoke significantly faster than the control group. Speech naturalness is another significant feature that determines the quality of a speaker. Sanders, Gramlich and Levine (1981) defined speech naturalness as the speech produced by speakers using the normal and customary speech patterns accepted by the community. Naturalness of speech is in a way determined by the presence of adequate measures of prosodic variations in spoken utterances. Prosody enables structuring of the discourse, by marking the information according to its relevance, thereby providing meaning to the message. The listener perceives acoustic changes in the new or relevant information that indicates the need

to pay greater attention. Prosodic features employed in news broadcasting assists in correct processing of the message by the listeners (Hirschberg & Pierrehumbert, 1986; Rodero, 2007). According to Strangert (2005), news reading is characterized by an overall fast tempo, with few short pauses. The prominent words are spoken with greater emphasis and are articulated distinctly.

Prosodic features such as intonation and rhythm are imperative and have to be congruent with the content of the message. Listeners value the use of prosody that is natural and with variations, but in adequate measure. Stress should be given not to make the event punchier, but to reveal its meaning. Shifting the position of the emphasis in a sentence can completely alter its meaning. Inexperienced broadcasters frequently use a kind of emphasis deviating from naturalness, overaccentuating or emphasizing words that do not add meaning to the message (such as pronouns, prepositions, or articles). Studies on prosody conducted in audio-visual broadcasting indicate a predisposition of newsreaders to produce circumflex intonation in constant and regular melodic patterns, which is considered as singsong (Brazil, 1978; Tench, 1990; Taylor, 1993; Nihalani & Po Lin, 1998; McGregor & Palethorpe, 2008; De-la-Mota & Rodero, 2010). Price (2008) labelled this as 'overall intonation template' and characterised it as a hyper- accentuation with an exaggerated pitch range.

Rodero (2006) reported that television news readers present circumflex contours with emphatic stress at the beginning, in the middle, and at the end of their statements. Repetition of this intonation contour occurs at regular intervals in news bulletins, resulting in a regular rhythm throughout the broadcast. This regular melody takes place independent of the message content (Price, 2008). Van Leeuwen (1984) concluded that newsreaders offer importance on everything they say, regardless of the actual meaning of their utterances. Newsreaders excessively segment the phonic groups, producing a break in the meaning of the message (Rodero & Campos, 2005). Each sentence must establish its own rhythm without having a false one impressed upon it. Speakers making use of wrong prosodic features are likely to be judged as bad speakers (Dahan, Tanenhaus & Chambers, 2002; Ito, Jincho, Minai, Yamane & Mazuka, 2012). Prosodic errors have an inevitable negative impact on native listeners' perceptual judgments of speech quality and intelligibility (Swerts & Zerbian, 2010). Hence, appropriate or inappropriate prosodic distributions can have a positive or negative impact on how a spoken message is appreciated by a listener.

Since there is a dearth of studies concerning the fluency characteristics of news readers, especially in Kannada language, the present study will provide insight about the continuity, rate and speech naturalness of the population of interest. Given that news readers tend to represent a role model for speech, it makes sense to explore their fluency characteristics. This information will also assist in providing effective education for broadcast journalism students. It will also create awareness in inexperienced news readers regarding the gold standards to be followed in broadcasting, which will in turn provide opportunities for self-correction and improvisation. This will enable the professionals to undergo better training to ensure better quality in broadcast presentations and the speech-language pathologists to offer the necessary training. Hence, the present study aims to analyse the fluency and naturalness characteristics in news readers with the objectives being; to compare the type and percentage of non-fluencies in news readers and controls; to investigate the speaking and reading rate in professional news readers and controls; and to study the naturalness characteristics differentiating news readers and controls.

Method

The current study used a standard group comparison design with the main aim of exploring the differences in fluency across the two group of participants, namely news readers and typically speaking individuals. The study was carried out as follows:

Participants

The study included two group of participants. Experimental group comprised of 10 news readers (8 females and 2 males) working in a private news channel, TV9. Control group consisted of 10 age and gender matched typically speaking individuals. All participants were degree holders, within the age range of 25-35 years, with their mother tongue being Kannada. The participants were ensured to have no history of speech, language or auditory pathology. The TV news readers had a minimum working experience of 2 years.

Materials

The materials used for the study comprised of a questionnaire to obtain demographic and other related information, a standardised Kannada reading passage for collecting reading samples and multidimensional Speech Naturalness scale (Kanchan & Savithri, 1997) for rating the naturalness of the speech samples.

Procedure

A prior written informed consent was obtained from all the participants. The participants were asked to fill a questionnaire to gather information concerning demographic details, medical and professional history. The participants were comfort-

ably seated in a quiet room and were instructed to read a standardized Kannada reading passage. The instruction given was "please read the given passage". After a time interval of 5 minutes, the participants were asked to speak about the given topic, "Pollution", for a period of 3-5 minutes. Preparation time of 1 minute was given before the speaking task. Both the speaking and reading samples were audio recorded using PRAAT software, sampled at 16 Hz and quantized at 16 bit sampling resolution at a nominal cut off frequency.

Three post-graduate speech language pathologists transcribed and analysed total of 40 samples collected from the two groups of participants. The samples were rated for naturalness using the Multidimensional Speech Naturalness scale (Kanchan & Savithri, 1997) based on 7 parameters namely, rate, continuity, effort, stress, intonation and rhythm, articulation and breathing pattern on a two point rating scale. The types and percentage of non-fluencies as well as rate of speech were analysed from the obtained samples. The samples were analysed for the presence of the following non-fluencies - word fillers (filled pauses), non-word fillers (interjections), unfilled pauses, phrase repetitions, revisions and fluffs.

Analyses

The reading and speaking samples were transcribed into IPA and analysed for type and percentage of disfluencies as well as reading and speaking rate. The percentage of disfluencies was calculated as the number of disfluencies per 100 words. The rate of speaking and reading was calculated as number of words per minute. SPSS (version 16) software package was used for statistical analysis. Shapiro Wilk test was used to check the normality of the data. Since the data was not normal and the standard deviation was high for some of the parameters, non-parametric test was done. Mann-Whitney U test was used to compare the percentage of disfluencies and rate between the news reading and control group. Kappa coefficient was used to check inter and intra judge reliability of naturalness ratings. Fischer Exact test was used to find out the association of naturalness parameters with the groups.

Results

The present study aimed to investigate the percentage of disfluencies, rate and speech naturalness in news readers with respect to control speakers. The results are discussed separately under percent disfluencies, rate and speech naturalness.

Percent Disfluencies

The percentage of disfluencies was higher in control group as compared to news readers both in reading as well as in speaking tasks as depicted in the Figure 1 and 2. X-axis represents the individual participants and Y-axis represents the percentage of disfluencies in Figures 1 and 2.

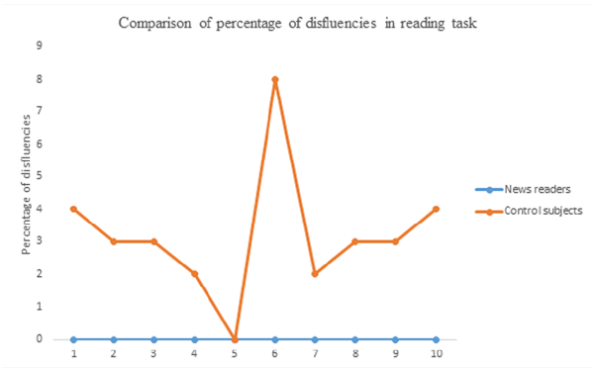

Figure 1: Comparison of percentage of disfluencies between news readers and controls in reading task.

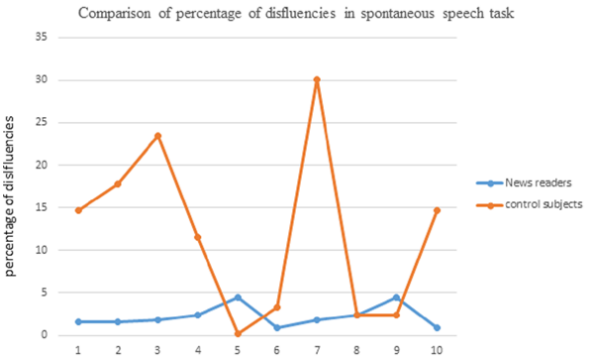

Figure 2: Comparison of percentage of disfluencies between news readers and controls in speaking task.

Mann-Whitney U test revealed significant difference in percentage of disfluencies between the two groups, both in reading and speaking tasks as shown in the Table 1.

The news readers exhibited normal disfluencies like interjections, pauses, revisions, word fillers, phrase repetitions and whole word repetitions while the control group in addition showed revisions and word fillers as well as occasional stuttering like disfluencies (SLDs) like part word repetitions, sound repetitions and prolongations.

Rate

The rate of speech, calculated in terms of words per minute (WPM) were higher in news readers as compared to control subjects in speaking task as shown in the Figure 3. X-axis represents the individual participants and Y-axis represents the speaking rate in Figure 3. Mann-Whitney U test revealed significant difference in speaking rate between the two groups as depicted in the Table 1. No significant difference was noted in reading rate between the two groups as depicted in Figure 4 and Table 1. X-axis represents the individual partic-

Table 1: Mann-Whitney U test results for percentage of disfluencies and rate in reading and speaking task

Variables	Z	p
% disfluencies in reading task	1.59	0.000**
% disfluencies in speaking task	1.96	0.023*
Rate of reading	0.51	0.111
speaking rate	1.34	0.019**

Table 2: Inter-judge reliability for naturalness parameters in reading and speaking tasks

Naturalness parameters	Speaking			Reading		
	J1 & J2	J2 & J3	J1 & J3	J1 & J2	J2 & J3	J1 & J3
Rate	0.8	0.75	0.81	0.79	0.75	0.82
Continuity	0.746	0.823	0.7	0.714	0.727	0.75
Effort	0.97	0.75	0.81	0.88	0.88	0.82
Stress	0.903	1	0.75	1	0.812	0.9
Intonation	0.76	0.78	0.83	0.73	0.67	0.77
Rhythm	0.69	0.75	0.79	0.76	0.93	0.85
Articulation	0.84	0.76	0.88	0.9	0.77	0.91
Breathing pattern	0.82	0.85	0.72	0.73	0.78	0.67
Overall naturalness	0.95	0.77	0.69	0.85	0.91	0.76

ipants and Y-axis represents the reading rate in Figure 4.

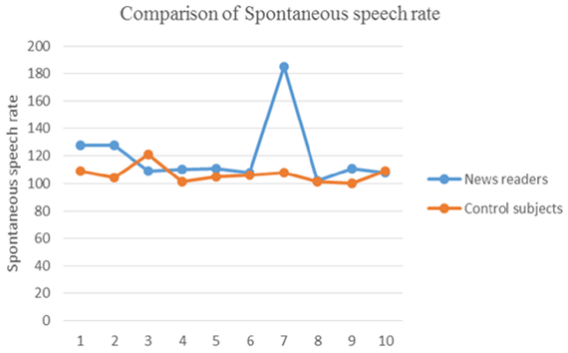

Figure 3: Comparison of speech rate between news readers and controls.

Figure 4: Comparison of rate of reading between news readers and controls.

Speech naturalness

Kappa coefficient was used to check inter and intra judge reliability of naturalness ratings. Kappa coefficient revealed a significant ($p < 0.05$) agreement in the judgements between the three judges on naturalness parameters as depicted in Table 2. Thus, positive correlation was found between judge 1 and judge 2, judge 2 and judge 3 and judge 1 and judge 3. Significant intra-judge reliability ($p < 0.05$) was also noted. Fischer Exact test was used to find out the association between the naturalness parameters and the groups in both reading and speaking tasks. The results revealed that the naturalness parameters including continuity and intonation in reading tasks were dependent on the groups. Among the naturalness parameters, in speaking task, rate, continuity, effort, intonation and articulation were dependent on the groups. Overall, naturalness in both reading and speaking tasks were also dependent on the groups.

Discussion

There was a significant difference in the percentage of disfluencies between the two groups, both in reading and speaking tasks. The percentage of disfluencies was higher in control group as compared to news readers both in reading as well as in speaking tasks. These findings are in agreement with that of Neil, Worrall, Day and Hickson (2003), where the authors reported of significantly fewer pronunciation errors and absence of discontinuities in professional news readers. This may be attributed to

the training underwent by the news readers to meet their professional requirements and also in part to the years of experience in the field of broadcasting. In general the selection for the job is incumbent on the individual's fluency skills and so naturally they are more fluent than the average individuals. The rate of speech was higher in news readers as compared to control subjects in speaking task. Significant difference was noticed in speaking rate between the two groups. This is consistent with the findings of Neil, Worrall, Day and Hickson (2003) and Mok, Fung and Li (2014), where the authors reported that the news anchors spoke significantly faster than the control group. This may be due to the tendency of normal subjects to speak clearly, by speaking carefully during an experimental task and thus may have slowed down the speech rate. However, news readers could speak clearly and quickly even at a faster speech rate, as they need to deliver as much as information as possible in a short period of time, due to their professional demands. Differences in the distribution of pauses during spontaneous speech may also contribute to the finding of reduced speech rate in control speakers as compared to news readers. No significant difference was noted in reading rate between the two groups.

Speech naturalness parameters, continuity and intonation in reading tasks were dependent on the groups. Among the naturalness parameters in speech task, rate, continuity, effort, intonation and articulation were dependent on the groups. Overall naturalness in both reading and speaking task were also dependent on the groups. These results are in agreement with the findings of Neil, Worrall, Day and Hickson (2003), Mok, Fung and Li (2014) and Strangert (2005), wherein the authors reported that the news readers have an overall fast tempo, with few short pauses, and prominent words spoken with greater emphasis and articulated distinctly.

Conclusions

The results of the present study indicated that the two groups of speakers, namely, the news readers and controls exhibited a significant difference in percentage of nonfluencies in both reading and speaking tasks. A significant difference between the two groups was also noticed in speaking rate and some of the naturalness parameters. The outcomes of this study will throw light on the presentation expertise, in terms of fluency, required in the field of broadcasting, and also can be made use in the education of journalism students to assist them in developing presentation expertise to transform into proficient broadcasters. According to Hudson, Roxanne, Lane and Pullen, (2005) "each aspect of fluency has an association with text comprehension". Hence the results also has clinical implications in the field of fluency and prosodic intervention for effective communication in general and for various speech disorders in particular.

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