

**THE IMPACT OF PAUSE USE ON FLUENCY IN
MULTILINGUAL SPEAKERS IN SOUTH AFRICA**

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DEDICATION

In the midst of a stuttering awareness week campaign, a journalist once asked me, “How can you dedicate so much time and energy to a disorder that impacts only 1% of the population while living in a country with such a high percentage of HIV?” Never, not that day, nor today, have I ever questioned my passion for this area of study.

This research is thus, most appropriately dedicated to not only the 1% of the population who stutter, but to all of those who strive to improve the research and service delivery for people who stutter each and every day.

DECLARATION

I, Penelope Ann Littlejohns, declare that this dissertation is my own unaided work,
other than the technical assistance as detailed in the Acknowledgement;
I alone am responsible for the content of this study and the conclusions presented;
and that no part of this dissertation has been submitted for a degree
at any other university.

Penelope Ann Littlejohns

Date

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ABSTRACT

Background: Speech rate plays an essential role in overall speech intelligibility in fluent speakers and is an important variable affecting fluency in people who stutter (PWS). Speech rate consists of both articulation rate and the pause intervals that occur within uninterrupted articulatory sequences (Tsao & Weismer, 1997). There are no normative speech rate data for South African English (SAE). In PWS, attempts to manipulate speech rate for improved fluency have mostly focused on articulation rate. This has typically involved either a reduction in the speed of articulatory movements, or in the prolonged movements between words to maintain a continuous voicing. However, articulation movements have been linked neurologically to the cerebellum (Ackermann & Hertrich, 1997; Ackermann, Graber, Hertrich & Daum, 1999; Hertrich & Ackermann, 1999), resulting in “pre-wired” articulation rates which may be difficult to generalise as a new “habitual” rate. Revisiting the role of pauses in speech rate and the manipulation of both frequency and duration of pauses was deemed necessary to investigate a potentially valuable alternative strategy to assist PWS in rate reduction and possible improved fluency.

Aims: The aims of this study were to investigate the speech rate and pause use (frequency and average duration of pauses) for first language (L1) and second language (L2) SAE fluent speakers and PWS in both monologue and reading tasks. In addition, this study investigated if the manipulation of pause use could increase fluency in L1 and L2 PWS given six sessions of pause instruction in SAE.

Methods: 80 fluent speakers (40 L1 SAE and 40 L1 isiZulu) and 14 PWS (7 L1 SAE and 7 L1 isiZulu) were recruited from the Johannesburg community and the University of the Witwatersrand campus. The fluent speakers and PWS were asked to engage in a 2-minute monologue and a reading task in order to calculate the mean speech rate, frequency of pauses and average pause duration for each group. Following baseline measures, the 14 PWS were randomly assigned to either immediate or delayed intervention consisting of 6 sessions addressing manipulation of pauses. A crossover treatment design allowed for repeated measures of speech rate and pause use across three data collection periods.

Results: Results revealed L1 and L2 SAE fluent speakers differed significantly in speech rate and frequency of pauses in reading and in pause length in the monologue. L1 and L2 PWS differed in frequency of pauses in reading. L1 fluent speakers and PWS differed in speech rate and both measures of pause use in reading. L2 fluent speakers and PWS differed in frequency of pauses in the monologue. Results from the crossover intervention for the PWS revealed a significant decrease in percentage syllables stuttered (% SS) for the delayed treatment group and a clinically significant decrease in % SS for both groups, in conjunction with a reduced speech rate that could be linked to increased frequency and/or average duration of pauses.

Conclusions: This study presented speech rate and pause use norms for both fluent speakers and PWS, L1 and L2 SAE speakers that may provide useful guidelines for speech language pathologists in South Africa. Additionally, the intervention results for PWS presented efficacy data for six sessions of pause manipulation with measurable findings for improved fluency.

Key words: Speech rate, people who stutter (PWS), pauses, fluency

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GLOSSARY OF TERMS

AE:	American English
Articulation rate:	The number of syllables or words per unit of time excluding pause intervals
AuE:	Australian English
Average Pause Duration:	Total pause time in milliseconds divided by number of total pauses
BCC:	Behavior Change Consortium
BE:	British English
FP:	Filled pause
NZE:	New Zealand English
NIH:	National Institutes of Health
L1:	First language
L2:	Second language
ms:	Milliseconds
Pause:	An interruption of the sound wave during speech that lasts a minimum of 200 or 250 milliseconds
Pause Frequency:	Total number of pauses
PWS:	People who stutter
SAE:	South African English
SIQ:	Semi-interquartile range
SLP:	Speech language pathologist
SP:	Silent pause or unfilled pause (UP)
Speech Rate:	Number of syllables or words per unit of time

spm:	Syllables per minute
sps:	Syllables per second
SS:	Syllables stuttered
SSI-4	Stuttering Severity Instrument-4 th Edition
STI:	Spatiotemporal index
UP:	Unfilled pause