LANGUAGE IN INDIA

Strength for Today and Bright Hope for Tomorrow

Volume 13:12 December 2013
ISSN 1930-2940

Segmental Overlap as a Function of Prime Duration in Simple and Complex Monosyllabic Word Naming in Speakers of English as Second Language

Varun Uthappa, A. G., M.Sc. (SLP)
Priyanka Shailat, M.Sc. (SLP)
Jaslin Thomas, M.Sc. (SLP)

==

Abstract

The study examines the effect of segmental overlap on naming monosyllabic words with distinct syllable complexities under a common priming paradigm with varying duration of prime presentation in second language speakers of English. 25 participants aged between 18 and 27 years are introduced to segmental primes (no overlap to complete overlap) presented across 100, 200 and 400 milliseconds prior to naming CVC and CCVCC monosyllabic words under a masked priming condition. The naming latencies are compared

across segmental primes and duration to reveal certain variations in the nature and extent of facilitation for simple and complex words, which are interpreted on the basis of factors influencing primed word naming such as processing time and type.

Key words: segmental overlap, word naming, masked priming, prime duration, monosyllable

Introduction

The process of word naming is influenced by the nature of preceding elements introduced as primes in controlled experimental conditions. In case of the elements being components of the word itself, the 'segmental overlap' hypothesis (Schiller, 1998) and its extension 'onset form priming' (Schiller, 2004) have stood the test of time. Neither languages nor their order of acquisition / learning have disputed with the general effects of intra-word constituent overlap that yields temporal facilitation of naming reactions (Chen, Chen, & Dell, 2002; Roelofs, 2006; Verdonschot et al., 2011; Uthappa, Shailat, & Shyamala, 2012).

Specifically, the components that have achieved the status of segments by enhancing naming speed have varied across languages and syllable structures from phonemes to syllables (Ferrand, Segui, & Grainger, 1996; Schiller, 1998). As adjuncts, the point of onset of the preceding prime and duration of its presentation has also been found to influence the nature of processing (automatic or propositional) (Neely, 1977; Versace & Nevers, 2003), in-turn concerning the influence of segmental overlap. Theoretically, as the number of components of a word presented as primes increases successively, the effects on naming latencies ought to follow a similar trend if all other factors are neutralized. The proposition loses strength as it is justified only under stipulated conditions of prime onset, duration and content (including structure) of the words. It is of interest to investigate this matter with greater accuracy as these factors not only influence the process of word naming, but may be operating in relative processes that direct one towards interactions between linguistic structure, temporal processing of events, cognitive mechanisms at work and more.

The present study explores the effects caused by two of these factors namely, syllable structure and prime duration (in other words, onset of the prime). The experimental conditions are defined as per the masked priming paradigm considered in a study by (Uthappa, Shailat, & Shyamala, 2012) with CVC monosyllables in second language speakers of English. The study revealed the presence of a vivid step-wise facilitation when CVC word naming was preceded by %%% (no prime), C%%, CV% and CVC primes presented for a duration of 100 ms before a backward masker (###) of 15 ms which immediately preceded the target word. The effects did not replicate for C%% 50 ms primes, clearly demonstrating the influence of prime duration in overlap based activation. As the structure of the syllable was simple, the interpretations were made solely on the basis of the segmental overlap hypothesis. However, it remains to be discovered if the effects of segmental overlap alone govern word naming speed across more complex structures.

In the current study, the CCVCC structure is subjected to the naming experiment in addition to the CVC in order to compare the effects across the simplest and most complex structures (constraint being, that the word should begin and end with a consonant) in monosyllabic words. Additively, the study explores the effects with primes of varying durations (100 ms, 200 ms, and 400 ms). The choice of these durations is made with the intention of procuring both the subliminal and conscious cognitive resources to act along a continuum in the process of primed-naming supported by documented evidences of the shift in the nature of processing with change in prime duration (Neely, 1977; Perea & Gotor, 1997; MacLeod & Masson, 2000) and also illustratively described by Klauer and Musch (2003).

Aim and Hypotheses

The study thus aims to outline the influence of syllable structure and prime duration on intra-word constituent primed monosyllabic word naming. The following hypotheses are formulated to address the issue:

1. Segmental overlap effects do not vary as a function of prime duration

2. Segmental overlap effects do not vary as a function of the complexity of syllable structure
3. Segmental overlap effects are immune to the co-occurring influence of syllable structure complexity and prime duration

Method

Participants

A total of 25 participants (20 females, 5 males) aged between 18 and 27 years were considered. All the participants were second language speakers of English with Kannada, a Dravidian language as their mother-tongue. The participants were all exposed to English as their medium of instruction throughout their schooling and higher education. There was no restriction on the total number of languages known apart from Kannada and English.

Stimulus

The stimulus comprised a list of 120 CVC and 180 CCVCC words (targets) programmed using DMDX software in a masked priming paradigm. The types of 'prime-target' pairs for CVC and CCVCC words were four and six, respectively. They were C%%-CVC, CV%-CVC, CVC-CVC, %%%-CVC (no prime) and C%%%%-CCVCC, CC%%%-CCVCC, CCV%%-CCVCC, CCVC%-CCVCC, CCVCC-CCVCC, %%%%%-CCVCC (no prime) for the two structures, respectively. Each of the 'prime-target' pairs contained a set of thirty items. The set of 30 items for the 'no prime' condition were extracted using n-item sampling from the combined lists finalized for the other 'prime-target' types. Hence, a total of 90 CVC and 150 CCVCC words were chosen.

The list of 90 CVC words was selected from the 240 items used by Uthappa, Shailat and Shyamala (2012) using n-item sampling. For the CCVCC type of words, a serial search of the Webster's New World College Dictionary (Agnes, 2000) was made and a list of 161 pronounceable words (as per a pronunciation check done on three individuals satisfying the participant selection criteria) finalized. N-item sampling was then used to arrive at 150 items. The stimulus words were chosen such that there was an equivalent distribution of words beginning with a certain letter in each of the lists. There was no dissimilarity between the number of phonemes (on pronunciation) and graphemes (on writing) in any of the words. Also, words that represented scientific labels, proper nouns and mythological terms did not find a place in the stimulus set.

Each stimulus item was programmed with an initiation point '*' for 500 ms, forward masker (### or #####) for 500 ms, prime (%%%, C%%, CV%, CVC, %%%%%, C%%%%, CC%%%, CCV%%, CCVC% or CCVCC) for 100, 200 or 400 ms and backward masker (### or #####) prior to the target (CVC or CCVCC) displayed for 2000 ms. The stimuli for each prime duration and syllable type were saved separately. A set of practice items was programmed using words that did not form a part of the main stimulus set.

Instrumentation and Utility

The stimulus was presented to the participants on a 15.4" Wipro Little Genius laptop screen placed in a well-lit and silent room at an inclination comfortable for reading to each participant. The naming responses were recorded using a Frontech hand held microphone, instructed to be positioned anywhere between four to six inches of the lips; and the recorded entities were analyzed for marking onset latency after excluding the incorrect responses (pronunciation error, disfluency, no response, delay beyond 1200 ms) using Check Vocal software through visuo-perceptual (spectrogram, waveform) and auditory-perceptual scrutiny. The raw data was analysed using statistical tools through the Statistical Package for Social Sciences (SPSS) software version 16.

Procedure

The participants were asked to read the target words aloud prior to the experiment. They were then guided through the process of the experiment. The participants were asked to watch the screen from the time the '*' appeared on the screen and continue looking as elements flashed; and name the word that was stable as soon as possible. The set of practice items were run till the participants confirmed adequate acquaintance in performing the task. The stimulus was then run, each program separately with a minimum of five minutes between them. On completion, the participants were rewarded with an edible token.

Analyses

The reaction time of each target named across the conditions for each participant was analysed. The average values of the 30 reaction times for each type of 'prime-target' pair in a condition were computed and data of 25 participants for the 12 CVC conditions and 18 CCVCC conditions were subjected for statistical analyses.

Results

The data obtained from each of the 25 participants across the 12 CVC conditions and 18 CCVCC conditions were subjected to descriptive statistical analyses to arrive at the mean and standard deviation values (Table 1).

Table 1

Mean and SD values of reaction times across 12 CVC and 18 CCVCC conditions of primed word naming

'prime-target' pair	Mean (SD) for 100 ms prime	Mean (SD) for 200 ms prime	Mean (SD) for 400 ms prime
%%%-CVC	536 (92)	553 (86)	552 (87)
C%%-CVC	524 (107)	529 (97)	515 (82)
CV%-CVC	493 (95)	504 (109)	475 (109)
CVC-CVC	473 (95)	448 (107)	282 (115)
%%%%%-CCVCC	591 (116)	578 (100)	593 (108)
C%%%%-CCVCC	568 (116)	535 (106)	541 (106)
CC%%%-CCVCC	552 (114)	519 (117)	506 (109)

CCV%%-CCVCC	547 (112)	501 (120)	493 (125)
CCVC%-CCVCC	534 (118)	474 (127)	415 (139)
CCVCC-CCVCC	520 (107)	449 (116)	298 (127)

The descriptive data was then subjected to Repeated Measures ANOVA across the conditions for each of the structures and prime durations separately. Statistically significant differences ($p < 0.001$) were revealed for CVC 100 [$F(3, 72) = 58.312$], CVC 200 [$F(3, 72) = 67.725$], CVC 400 [$F(3, 72) = 164.152$], CCVCC 100 [$F(5, 120) = 23.631$], CCVCC 200 [$F(5, 120) = 55.404$] and CCVCC 400 [$F(5, 120) = 254.696$]. The data underwent further statistical treatment using Bonferroni's pair-wise comparisons across conditions within each prime duration and structure to derive the presence or absence of statistically significant differences (Tables 2 – 5).

Table 2

Bonferroni's pair-wise comparison across 'prime-target' conditions for CVC 100, 200 and 400 ms prime durations

	%%%-CVC			**C%%-CVC**			**CV%-CVC**			**CVC-CVC**		
'prime-target' pairs	**100**	**200**	**400**	**100**	**200**	**400**	**100**	**200**	**400**	**100**	**200**	**400**
%%%-CVC	-	-	-	NS	S	S	S	S	S	S	S	S
C%%-CVC				-	-	-	S	S	S	S	S	S
CV%-CVC							-	-	-	S	S	S
CVC-CVC										-	-	-

Note. S - Significant difference ($p < 0.005$), NS – No significant difference

Table 3

Bonferroni's pair-wise comparison across 'prime-target' conditions for CCVCC 100 ms prime duration

Prime	**%%%%%**	**C%%%%**	**CC%%%**	**CCV%%**	**CCVC%**	**CCVCC**
%%%%%	-	NS	S ($p < 0.05$)	S	S	S

C%%%%		-	NS	S ($p < 0.05$)	S	S
CC%%%			-	NS	NS	S
CCV%%				-	NS	S
CCVC%					-	NS
CCVCC						-

Note. S - Significant difference ($p < 0.005$), NS – No significant difference

Table 4

Bonferroni's pair-wise comparison across 'prime-target' conditions for CCVCC 200 ms prime duration

Prime	**%%%%%**	**C%%%%**	**CC%%%**	**CCV%%**	**CCVC%**	**CCVCC**
%%%%%	-	S	S	S	S	S
C%%%%		-	NS	S	S	S
CC%%%			-	NS	S	S
CCV%%				-	S ($p < 0.05$)	S
CCVC%					-	NS
CCVCC						-

Note. S - Significant difference ($p < 0.005$), NS – No significant difference

Table 5

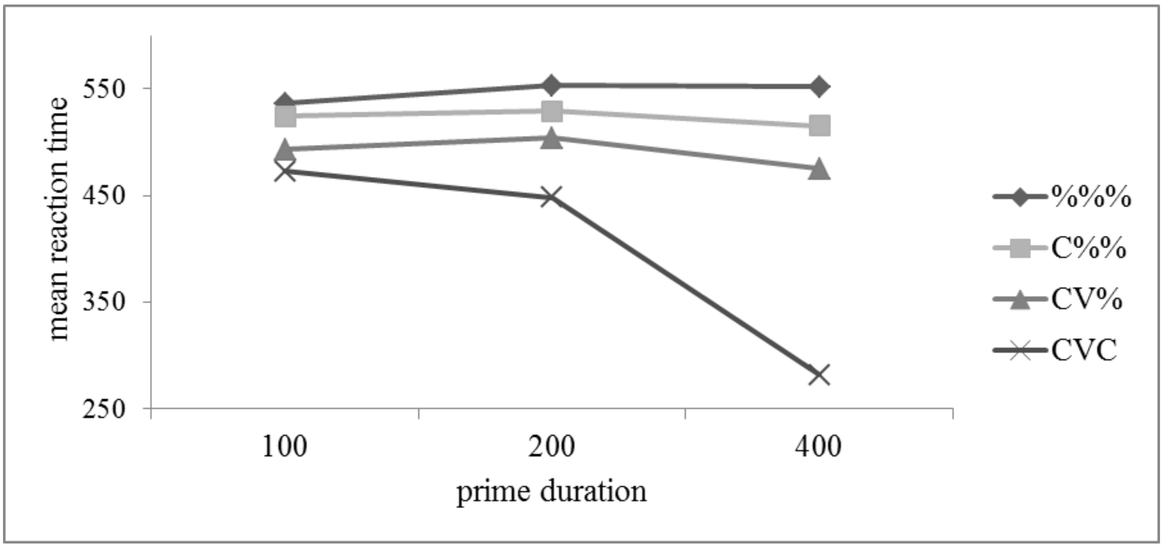
Bonferroni's pair-wise comparison across 'prime-target' conditions for CCVCC 400 ms prime duration

Prime	**%%%%%**	**C%%%%**	**CC%%%**	**CCV%%**	**CCVC%**	**CCVCC**
%%%%%	-	S	S	S	S	S
C%%%%		-	S	S	S	S
CC%%%			-	NS	S	S
CCV%%				-	S	S
CCVC%					-	S
CCVCC						-

Note. S - Significant difference ($p < 0.005$), NS – No significant difference

The data were further analysed using Repeated Measures ANOVA to compare across the prime durations for each condition of the prime for CVC and CCVCC words independently. For the CVC words, statistically significant differences ($p < 0.05$) were found across primed durations with CV% [$F(2, 48) = 3.804$] and CVC [$F(2, 48) = 103.484$] primes while the %%% [$F(2, 48) = 1.8$] and C%% [$F(2, 48) = 0.884$] primes did not exhibit any difference. On investigating further with Bonferroni's pair-wise comparison for CV% and CVC primes across durations, significant differences were found between for 200 versus 400 ms ($p < 0.01$), and 100 versus 400 ms and 200 versus 400 ms ($p < 0.001$) respectively. A visual representation of the influence of duration on segmental primes in CVC word naming is made in Figure 1.

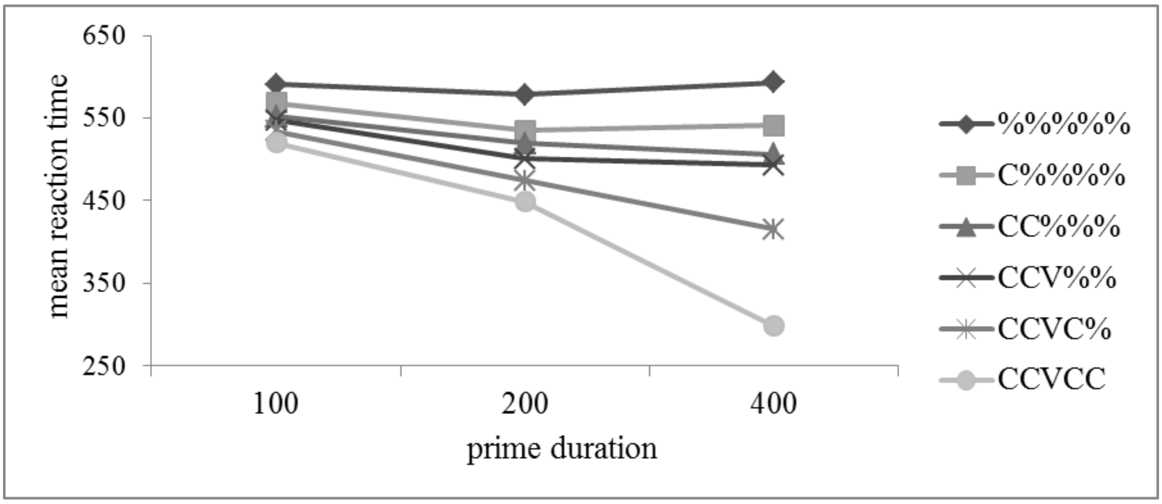
Figure 1. Mean reaction time across prime types and prime durations for CVC word naming



For the CCVCC words, statistically significant differences ($p < 0.05$) were found across primed durations for all primes {C%%%% [$F(2, 48) = 5.859$], CC%%% [$F(2, 48) = 8.266$], CCV%% [$F(2, 48) = 12.654$], CCVC% [$F(2, 48) = 37.704$] and CCVCC [$F(2, 48) = 119.564$]}, except %%% [$F(2, 48) = 1.421$]. The Bonferroni's pair-wise comparison for all the primes where differences were evident across durations showed significant differences as follows: C%%%% [100 versus 200 ms ($p < 0.01$)], CC%%% [100 versus 200 ms ($p < 0.01$), 100 versus 400 ms ($p < 0.05$)], CCV%% [100 versus 200 ms ($p < 0.01$), 100 versus 400 ms (p

< 0.01)], CCVC% [100 versus 200 ms ($p < 0.001$), 100 versus 400 ms ($p < 0.001$), 200 versus 400 ms ($p < 0.001$)] or CCVCC [100 versus 200 ms ($p < 0.001$), 100 versus 400 ms ($p < 0.001$), 200 versus 400 ms ($p < 0.001$)]. A visual representation of the influence of duration on segmental primes in CCVCC word naming is made in Figure 2.

Figure 2. Mean reaction time across prime types and prime durations for CCVCC word naming



Discussion

CVC at 100 ms

The findings revealed the presence of facilitation of word naming when two segments or more were presented as primes. The outcome differs slightly from the findings of Uthappa, Shailat and Shyamala (2012) who found the presence of facilitation even with a single overlapping segment at 100 ms. The results are compliant with their findings at 50 ms indicating the probability of the effects modulating in a continuum of time. It also demonstrates that subliminal processing operating when prime visibility is negotiable both by virtue of its duration and the maskers (Neely, 1991; Shelton & Martin, 1992; Forster & Veres, 1998) may not necessarily pick up the elements that are less redundant, as is the case here with a single consonant lacking in exactitude of information about the ensuing word or the consonantal activation being insufficient for its perusal in the lexical activation process.

CVC at 200 ms

On presentation of primes for a duration of 200 ms i.e. 215 ms pre-onset of the target, each segment caused a significant difference to naming speed in the positive direction. Moreover, the effects generated by each additional segment were substantially more than the preceding one pointing towards the prominence of intra-word components in word naming as in distributed models of word processing (Seidenberg & McClelland, 1989) where letter nodes also form a part of the fundamental components of word representation.

CVC at 400 ms

The facilitation at this longer duration of prime presentation follows the trend of the effects with 200 ms primes although the extent may be greater. On observation of the absolute values, the facilitation clearly appears to be dramatic particularly when the prime is the word itself. It points towards a probable shift in the nature of processing, an assumption that finds support on subsequent analyses.

CVC across prime durations

The 'no prime' conditions across the three durations of the prime were equal indicating that the paradigm estimated naming latencies reliably. As far as the overlapping segmental primes are concerned, the duration of the prime did not exhibit any effect until the occurrence of the second segment. This supports the proposition that a single letter is immune to the duration of visibility of the prime possibly due to dearth of linguistic information conveyed by the first letter regarding the simple monosyllabic word itself which may be indicative of the presence of syllable level effects (Brand, Rey, & Peereman, 2003) in the grey areas between the isolated letter and complete syllable. The lack of segmental overlap facilitation at the shorter prime duration by the first segment may have been compounded by this factor. The explanation becomes more relevant considering that the effects of 400 ms primes as the second and third segments overlap move towards a distinct mode of processing that is influenced by the completeness of the prime, which in turn refers to the strength of the linguistic content conveyed. On closer observation, it may be noted that repetition primes at 100 and 200 ms derive output in the range of 400 to 500 ms. At 400 ms the output is speeded remarkably below 300 ms justifying the above discussion.

CCVCC at 100 ms

The results were remarkably similar to those obtained with CVC words in terms of generic segmental overlap with the exception of the initial segment priming the word naming process positively in CCVCC words. The difference however lies in the lack of discrete levels of facilitation with increasing overlap of segments. Each of the primes do not differ from their nearest overlapping neighbours in terms of the extent of acceleration caused to the process of executing the task. Interestingly, repetition priming which has consistently been faster across durations with CVC words fails to create the gulf between itself and the four segment prime (CCVC%). It implies that a prime duration of 100 ms (i.e. 115 ms pre-onset of the target) may not be sufficient to extract information about lexical status in time to influence immediate production. On the other hand, the fact that repetition yields facilitation and the direction of the extent of it corresponds with the number of overlapping segments converges on the opinion of a dominant bottom-up cohort based extraction (Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001).

CCVCC at 200 ms

The segmental primes at 200 ms act in a successively effective manner yielding greater facilitation as the overlap increases beginning with a single letter segment. The difference in the extent of facilitation generated between successive segments does not occur till the appearance of the consonant segment located post the central vowel. The difference evidenced between CCV%% and CCVC% however, does not exist between CCVC% and CCVCC which may be indicative of the significance of consonants (New, Araujo, & Nazzi,

2008) in key positions in a word that may direct the course of activation of the target word. Hence, an additional consonant that follows the key consonant does not create any greater an effect than that deemed to be caused by sequential appearance of intra-word components in an input driven serial activation framework.

CCVCC at 400 ms

The findings resoundingly accept the segmental overlap hypothesis (Schiller, 1998) and almost completely delineate the function of each segment effectively. It implies that a prime presented 415 ms before onset of a target word is absolutely engaged in speeding the process of word naming. The only deviation stems from the lack of difference between the effects caused by CC%%% and CCV%% primes. It may well be explained on the basis of the predominance of components (or the lack of it for vowels) in adjudicating the content of a lexical entity. As vowels do not form the core of the representation regarding the content of a word, an additional vowel may not have caused a substantial change in facilitation.

CCVCC across prime durations

The 'no prime' condition does not exhibit variation in any of the three sets of stimuli confirming the effectiveness of the priming paradigm in estimating naming reaction time. The segmental overlap does not follow similarly across durations with the 100 ms condition differing from that of 200 ms for each type of prime indicating a shift in the resources activated for priming depending on the duration of prime presentation. Interestingly, the effects caused by the 100 ms primes do not significantly differ with 400 ms primes for C%%%% primes. The difference between their effects set in with CC%%% primes, although the level of significance is not the same as that with CCV%% and the subsequent primes. A variable action of implicit resources in terms of the nature of their influence on speeding the naming latency may be a suitable explanation. To add to the intricacies, the effects caused by CCVC% and CCVCC primes differ across the three prime durations pointing to linguistic factors that emerge as the syllable takes the 'close' form with the pre-final and final consonants appearing. Thus, the syllable structure of primes themselves may be assumed to initially trigger serial stimulus driven mechanisms in accordance with the activity in the perceptual representational system (Daniel, 1992) and employ top-down lexical activation based processes with increased visibility and strategizing time (Versace & Nevers, 2003).

General Discussion

In sum, the segmental overlap hypothesis is supported by the findings of each of the 'prime-target' conditions across varying prime durations for both simple (CVC) and complex (CCVCC) monosyllabic words. Prime duration appears to play a role in activating a variety of mechanisms (internal) by drawing information from various levels of word representation. However, it is not prime duration alone that governs the selection of these processes. The syllable type and number of components of the word being presented as primes dictate the operation of temporal factors. In both structures, it is an 'open' or just initiated syllable that does not lucidly express its linguistic / higher order influence on the basis of prime duration. As a prime approaches the 'closed' syllable status, the longer prime durations elicit greater facilitation than their competitors; and whether this nature is unique to second language speakers remains to be investigated.

Considering that the linguistic factors or holistic activations take prominence after the vowel in both CVC and CCVCC structures, an inspection of the effects caused by components of words prior to and with the vowel explain the dynamics of serial activation. Activation by serial presentation of components differs for simple and complex syllable structures although both are monosyllables. The simple monosyllable does not exhibit clear duration specific effects with single letter overlap; and the only other 'open' syllable prime (CV%) differing in its naming speed outcome at 400 ms from 200 ms alone, does not delineate the nature of processing across durations. The complex syllable structure contributes sufficiently. It is evident that primes presented 115 ms prior to the target engage different processing mechanisms from those adopted by primes presented 215 or 415 ms prior to the target. The two longer prime presentations also differ in their action, but only late in to the word.

Thus, segmental overlap varies differently as a function of prime duration in both simple and complex monosyllabic words, and due to their combinatory effects in speakers of English as second language with regard to the extent of facilitation which is in turn a possible denouement of the cognitive system's chosen processing strategies; thereby, rejecting the proposed hypotheses.

Conclusions

The segmental overlap hypothesis has been found to be largely consistent in its appearance with simple and complex monosyllabic words. The effect of each overlapping segment however, has been variable. In particular, complex words have been facilitated better when consonant segments in positions after the central vowel have formed parts of the prime. The effects of facilitation have been most robust for longer prime durations as the prime length approaches word completion. The initial segments on overlap have shown lesser differences across durations of prime presentation in terms of speeding the naming process. Thus, syllable structure, intra-word segments and the temporal allowance for recruitment of various cognitive resources have all been found to influence the magnitude of priming through segmental form relatedness.

==

References

Agnes, M. (4th Ed.). (2000). *Webster's new world college dictionary*. Foster: IDG Books Worldwide.

Brand, M., Rey, A., & Peereman, R. (2003). Where is the syllable priming effect in visual word recognition? *Journal of Memory and Language, 48*, 435-443.

Chen, J. Y., Chen, T. M., & Dell, G. S. (2002). Word-form encoding in Mandarin Chinese as assessed by the implicit priming task. *Journal of Memory and Language, 46*, 751-781.

Coltheart, M., Rastle, K., Perry, C., Langdon, R., & Ziegler, J. (2001). DRC: A dual route cascaded model of visual word recognition and reading aloud. *Psychological Review, 108*, 204-256.

Daniel, S. L. (1992). Priming and multiple memory systems: Perceptual mechanisms of implicit memory. *Journal of Cognitive Neuroscience, 4*(3), 244-256.

Ferrand, L., Segui, J., & Grainger, J. (1996). Masked priming of word and picture naming: The role of syllabic units. *Journal of Memory and Language*, *35*, 708-723.

Forster, K. I., & Veres, C. (1998). The prime lexicality effect: Form-priming as a function of prime awareness, lexical status, and discrimination difficulty. *Journal of Experimental Psychology: Learning, Memory & Cognition*, *24*(2), 498-314.

Klauer, K. C., & Musch, J. (2003). Affective priming. In Musch, J., & Klauer K. C. (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (9-24). Taylor and Francis e-library.

MacLeod, C. M., & Masson, M. E. J. (2000). Repetition priming in speeded word reading: Contributions of perceptual and conceptual processing episodes. *Journal of Memory and Language, 42*, 208-228.

Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General*, *106*, 226-254.

Neely, J. H. (1991). Semantic priming effects in visual word recognition: A selective review of current findings and theory. In Besner, D., & Humphreys, G. W. (Eds.), *Basic processes in reading: Visual word recognition* (264-336). Hillsdale, NJ: Erlbaum.

New, B., Araujo, V., & Nazzi, T. (2008). Differential processing of consonants and vowels in lexical access through reading. *Psychological Science, 19*(12), 1223-1227.

Perea, M., & Gotor, A. (1997). Associative and semantic priming effects occur at very short SOAs in lexical decision and naming. *Cognition*, *62*, 223-240.

Roelofs, A. (2006). The influence of spelling on phonological encoding in word reading, object naming and word generation. *Psychonomic Bulletin & Review*, *13*, 33–37.

Schiller, N. O. (1998). The effect of visually masked syllable primes on the naming latencies of words and pictures. *Journal of Memory and Language*, *39*, 484–507.

Schiller, N. O. (2004). The onset effect in word naming. *Journal of Memory and Language, 50*(4), 477-490.

Seidenberg, M. S., & McClelland, J. L. (1989). A distributed developmental model of word recognition and naming. *Psychological Review, 96*, 523-568.

Shelton, J. R., & Martin, R. C. (1992). How semantic is automatic semantic priming? *Journal* *of Experimental Psychology: Learning, Memory & Cognition*, *18*, 1191-1210.

Uthappa, V. A. G., Shailat, P., & Shyamala, K. C. (2012). The role of intra-word constituents in word naming in adult speakers of English as second language. *International Proceedings of Economics Development and Research, 33*, 182-187.

Verdonschot, R. G., Kiyama, S., Tamaoka, K., Kinoshita, S., Heij, W. L., & Schiller, N. O. (2011). The functional unit of Japanese word naming: Evidence from masked priming. *Journal of Experimental Psychology: Learning, Memory and Cognition, 37*(6), 1458-1473.

Versace, R., & Nevers, B. (2003). Word frequency effect on repetition priming as a function of prime duration and delay between the prime and the target. *British Journal of Psychology*, *94*, 389-408.

===

Acknowledgments

The authors are grateful to Dr. S. R. Savithri, Director, All India Institute of Speech and Hearing, Mysore for permitting us to conduct the study. This paper is a lateral outcome of an ongoing AIISH Research Fund project titled "Word naming: The influence of syllable structure and prime duration on intra-word constituent processing in adult speakers of English as second language". The authors express their sincere gratitude to all the participants of the study. The authors are grateful to Ms. Sangeetha G. S., Research Officer, AIISH, Mysore for her timely support.

Varun Uthappa A. G., M.Sc. (Speech-Language Pathology)
Department of Clinical Services
All India Institute of Speech and Hearing
Manasagangothri, Mysore - 570006
Karnataka, India
varunuthappaag@gmail.com

Priyanka Shailat, M.Sc. (Speech-Language Pathology)
Centre for Rehabilitation and Education through Distance Mode
All India Institute of Speech and Hearing
Manasagangothri, Mysore - 570006
Karnataka, India
shailatpriyanka@gmail.com

Jaslin Thomas, M.Sc. (Speech-Language Pathology)
Department of Clinical Services
All India Institute of Speech and Hearing
Manasagangothri, Mysore - 570006
Karnataka, India
jaslin.thomas@gmail.com