

The relationship between reading ability and lateralized lexical decision[☆]

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Abstract

Although lexical decision remains one of the most extensively studied cognitive tasks, very little is known about its relationship to broader linguistic performance such as reading ability. In a correlational study, several aspects of lateralized lexical decision performance were related to vocabulary and reading comprehension measures, as assessed using the Nelson–Denny Reading Test. This lateralized lexical decision task has been previously shown to demonstrate (1) independent contributions from both hemispheres, as well as (2) interhemispheric interactions during word recognition. Lexical decision performance showed strong relationships with both reading measures. Specifically, vocabulary performance correlated significantly with left visual field (LVF) word accuracy and LVF non-word latency, both measures of right hemisphere performance. There were also significant, though somewhat weaker, correlations between reading comprehension and RVF non-word latency. Lexicality priming, a measure of interhemispheric communication during lexical decision, was also correlated with reading comprehension. These results suggest that hemispheric interaction during word recognition is common, and that lexical processing contribution from the right hemisphere, something commonly taken as minor and inconsequential, can lead to significant performance benefits and to individual differences in reading. © 2004 Elsevier Inc. All rights reserved.

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1. Introduction

Lexical decision has a long history of exploring representation of the mental lexicon in the two cerebral hemispheres. For this task, a word or meaningless non-word is briefly presented and the observer is tasked with identifying its lexical category. Through stimulus lateralization we are capable of placing greater task demands on one hemisphere over the other. One of the most reproducible findings in lateralized word recognition experiments is a right visual field (RVF) advantage for lexical decision, indicating specialized word recognition

resources in the left hemisphere. This is a long established finding (Bradshaw & Gates, 1978; Chiarello, 1985; Leiber, 1976) that appears to be true across languages (Babkoff & Ben-Uria, 1983; but see Melamed & Zaidel, 1993) and independent of scanning habits (Bradshaw, Nettleton, & Taylor, 1981). Of significant note is that the RVF advantage is commonly observed for word stimuli but not for non-word stimuli (Chiarello, 1985; Iacoboni & Zaidel, 1996). Indeed, the ubiquitous RVF advantage for word stimuli provides strong indication of specialized word processing resources in the left hemisphere.

The dominant left hemisphere is said to have access to dual routes of word recognition, namely a lexical one and a sub-lexical phonological assembly one. Although such dual route models take various forms (Coltheart, Curtis, Atkins, & Haller, 1993; Paap & Noel, 1991), they generally posit the sublexical route as an orthographic to phonemic translation route. This route is available only to the left hemisphere, thereby providing multiple

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means by which word recognition takes place, contributing to a processing advantage. Ellis and Young (1988) present a dual-route model of written word identification describing left and right hemisphere lexical processing stages. The first route involves matching the word to its entry in the visual lexicon, activating the stored representation, including the semantic system, and finally production of a response. Called the lexical route, this processing mechanism is believed to exist in both hemispheres (Zaidel, 1998, 1999). The second non-lexical route performs grapheme to phoneme conversion and therefore allows for “phonic reading” (Ellis & Young, 1988; Ellis, Young, & Anderson, 1988). The two routes are influenced by different factors: the first by orthographic and semantic variables such as word length, frequency, and concreteness and the second by orthographic and phonological variables such as word length and regularity (Zaidel, 1999).

Coltheart et al. (1993) present a similar dual-route model of lexical access, and provide evidence that a single route is not sufficient to describe lexical processing behavior. Like Ellis et al. (1988), the authors support the existence of separate phonological and orthographic routes. Being lexical in nature, the orthographic route is accessed for words but not for pseudo-words, since there exist no lexical entries for these stimuli. The phonological route is non-lexical in nature, and is used for the reading aloud of both words and pseudo-words. When these two routes are combined, as has been proposed by some parallel distributing processing (PDP) advocates (Seidenberg & McClelland, 1989), important aspects of reading behavior such as pseudo-word reading and exception word reading may not be easily explained (Coltheart et al., 1993). In sum, the hemispheric dual-route model posits that the hemispheres can perform lexical access independently, and, perhaps, in parallel.

Not only do the two hemispheres possess different specialized capabilities for word recognition, they can also interact in complex ways. Iacoboni and Zaidel (1996) observed that the presence of distracter letter strings in the unattended visual field contralateral to the target negatively impacts word processing efficacy in the target hemisphere. Specifically, unattended lexical stimuli reduced accuracy and increased response latency for word identification, even though they had no significant impact on non-word performance. The importance of interhemispheric communication during word recognition is further supported by the finding that presentation of dual copies of the target stimulus in each visual field improves lexical decision performance for words but not non-words (Mohr, Pulvermuller, & Zaidel, 1994; Zaidel & Rayman, 1994). In sum, these results provide a strong indication of interhemispheric exchange during word recognition.

Not only does the presence of contralateral distracters disrupt lexical access in the target hemisphere, but

lexicality of the distracters can have complex effects on word and non-word recognition. Iacoboni and Zaidel (1996) observed that including contralateral targets impaired performance, compared to when no distracters were included. Also, when target and distracter wordness were congruent (both words or both non-words), lexical decision performance was improved compared to incongruent presentation. This effect, termed “lexicality priming,” was not due to response bias, and is believed to represent a benefit from having both hemispheres engaged in similar information processing tasks (i.e., lexical access or lexical access failure). The important feature of the lexicality priming measure, however, comes in the fact that it provides a measure of interhemispheric communication, as any effect of the contralateral distracter must be due to interhemispheric communication. More specifically, greater influence of distracter lexicality suggests greater interhemispheric transfer. Consequently, lexicality priming provides a useful measure of communication between the hemispheres during the lexical decision task. It is important to recognize that we do not address the nature of the interhemispheric communication which lexicality priming is assumed to represent. For example, whether it involves joint hemispheric representation of the lexical stimuli (bilateral neural assemblies of Pulvermuller, 1996), or transfer of stimulus information from a less competent to more competent hemispheric processor (see Zaidel, 1998, for review).

Although the finding of hemispheric specialization and interaction effects are now commonplace with lexical decision, we still know very little about how the two hemispheres interact during normal reading. It has been suggested that both hemispheres possess mental lexicons of similar structure (Chiarello, 1988), and that many experimental tasks underestimate the language contributions of the right hemisphere (Querne, Eustache, & Faure, 2000). Even work with special populations, such as acquired dyslexics, has suggested that the right hemisphere possesses many of the same capabilities as the left but does not assume a strong language role unless released from control by the left (Coslett & Monsul, 1994). The hypothesis that the left hemisphere downplays right hemisphere contributions to language by taking a dominant role, although both hemispheres possess significant language ability, has been a major theme of language laterality research for the past 20 years (Coslett & Saffran, 1998).

Data from acquired deep dyslexia strongly supports the thesis that the right hemisphere possesses some linguistic processing ability, even phonological in nature, although it is inhibited by the left in normal everyday use. Deep dyslexics are patients who suffer brain damage, leading to grapheme–phoneme translation deficits and to semantic errors during reading aloud. There are two competing accounts of the syndrome of deep dys-

lexia. The first claims that important reading systems in the left hemisphere become damaged, and that the left continues to perform word recognition with an incompletely functioning system. The second account also assumes left hemisphere damage, but asserts that the impaired output derives from the less competent right hemisphere performing the task. Strong support for the latter view has recently suggested that the right hemisphere possesses significant (although still insufficient) linguistic processing abilities (Coltheart, 1990; Patterson, Vargha-Khadem, & Polkey, 1989; Price et al., 1998).

There is other experimental evidence that successful performance on many cognitive tasks, including those of a linguistic nature, is highly dependent on successful interaction between the hemispheres, despite left hemisphere dominance. Belger and Banich (1998) observed that the more complex the cognitive task, the more hemispheric interaction contributed to task performance. Specifically, the advantage introduced by dividing task performance between the hemispheres increased as a function of task complexity. This has been supported by several dual task studies that used manual dexterity and hand preference, potential measures of hemispheric involvement due to exclusive control of the limbs by the contralateral hemisphere. For example, O'Boyle, Gil, Benbow, and Alexander (1994) found that mathematically gifted children used both hemispheres more than non-gifted children, as measured by changes in hand-tapping speeds during these tasks.

Although some research has explored the effect of individual differences in reading ability on controlled tasks such as lexical decision (Chateau & Jared, 2000; Jared, Levy, & Rayner, 1999), little is known about the relative contributions of the two cerebral hemispheres for these different tasks. In the current experiment, lateralized presentation was used to manipulate hemispheric involvement for the lexical decision task, and therefore assess the importance of hemispheric asymmetry for broad linguistic processing. Some authors have questioned whether such lateralized input activates the same mechanisms enlisted during central presentation (Christman, 2001). Indeed, it is clear that normal visual perception is neither systematically lateralized nor tachistoscopic in nature, and that both hemispheres likely receive the majority of information entering the visual system. It is conceivable that tachistoscopic presentation changes the way the two hemispheres interact, thereby providing an altered view for how they recognize words (Christman, 2001). However, if lateralized performance shares a relationship with (non-lateralized and non-tachistoscopic) reading ability, then there must be some common processing involved. To our knowledge, Zaidel, Taylor, and Clarke (1990) are the only to examine the relationship between lateralized lexical decision performance and (normal) reading ability. Spe-

cifically, they observed a positive correlation between reading comprehension and RVF semantically primed word recognition accuracy, consistent with the hypothesis that common processes are shared in these tasks.

There is a good reason to believe that lateralized tasks provide effective measures of independent hemispheric processing capabilities and that the relative hemispheric contributions are largely determined by the cognitive task. For example, Levy, Heller, Banich, and Burton (1983) found that the two hemispheres differ in their ability to pronounce consonant–vowel–consonant (CVC) non-words, with the right hemisphere relying more on letter-by-letter encoding rather than phonological encoding used by the left hemisphere. However, this does not imply that the left hemisphere is always dominant for the task, as for both centrally presented and bilateral presentations errors indicated that both hemispheres engaged in processing of the stimulus (Luh & Levy, 1995). The similarities of bilateral and centrally presented stimuli suggest that tachistoscopic lateralization may not disrupt normal modes of hemispheric interaction, and additional research has shown further similarities between these conditions (Banich & Nicholas, 1998; Hellige, Cowin, & Eng, 1995).

In the current study, performance on both the lexical decision task and a general reading ability tasks are compared to explore similarities in performance. Although both tasks had been thoroughly examined before, much less is known about the relationship of lexical decision to reading, and even less is known about hemispheric contributions to this relationship. For example, do subjects who show strong levels of inter-hemispheric communication during lexical decision show stronger reading ability than subjects with less interhemispheric communication? Is lexical decision performance in one hemisphere or the other a more telling indicator of reading ability?

2. Methods

2.1. Participants

Sixty right-handed undergraduate UCLA students and staff participated in the study (32 females and 28 males). Each subject had normal or corrected-to-normal vision and no history of neurological illness. Handedness was assessed using a modified version of the Edinburgh Handedness Inventory (Oldfield, 1971). This seventeen question survey included questions regarding preferred handedness for simple daily tasks (e.g., drawing, writing, throwing), as well as questions regarding family sinistrality. All subjects reported possessing strong right-handed dominance. The majority of subjects were paid for their participation at a rate of \$10/h. However, some subjects chose to participate for

undergraduate course credit and were not financially compensated. A comparison of gross performance ability for paid and unpaid subjects revealed no differences.

2.2. Materials

Stimuli were 120 words and 120 pronounceable non-words taken from the list used by Iacoboni and Zaidel (1996). All stimuli were between three and five letters in length. Words were divided into high-frequency and low-frequency categories based on the frequency of written use norms developed by Francis and Kucera (1982). High-frequency words were defined as those occurring greater than 100 times per million and low-frequency words were defined as those occurring fewer than 20 times per million. Words were also divided into two categories based on their orthographic regularity (regular and irregular), based on Seymour, Bunce, and Evans (1992). For the sake of simplicity, word frequency and orthography are not examined in the current experiment, although these factors are examined for the same stimulus list in a separate study (Iacoboni & Zaidel, 1996).

The Nelson–Denny reading test (Part G) was administered to assess reading ability (Brown, Fishco, & Hanna, 1993). This test is composed of three parts: vocabulary, reading comprehension, and reading speed. The vocabulary section includes 80 items with a time limit of 15 min. The reading comprehension section allows 20 min for the completion of 28 items. Reading speed was assessed by counting the number of words read in the first reading comprehension passage in 60 s. This measure was omitted in the current analysis for two reasons. First, several participants chose to read the questions concerning the first passage even after explicit instructions not to do so, and consequently had very low reading speed scores. Second, the benefit of including this measure compared to the loss in power to detect other differences due to multiple comparisons was questioned. The remaining measures, reading comprehension and vocabulary, provide very different measures of linguistic ability, with the first being a more conventionally recognized reading ability measure, and the second measuring one's ability to tap lexical representations and the meanings attached to those representations.

2.3. Design and procedure

Subjects were seated at a fixed distance of 57.3 cm from a 13 in. AppleColor high-resolution RGB monitor with their chins in a chin-rest and eyes aligned with a black fixation cross in the center of the screen. Subjects were instructed to maintain their gaze on the fixation point throughout the experiment. Each trial began with presentation of the lexical stimulus, followed by the

subject's response. The stimuli, which were black text on a white background, were displayed either to the left or right of the fixation point for 165 ms (11 refresh cycles of the monitor) to minimize the possibility of scanning eye movements (Pirrozolo & Rayner, 1980). The innermost edges of the stimuli were 1.0° of visual angle from fixation, and stimuli subtended between one and three degrees in length.

Stimuli were underlined to discriminate the target from the distracter letter string, which was presented in the visual field opposite the target. This distracter string was matched in length with the target but was not underlined. Subjects were instructed to ignore the distracter letter string and respond based solely on the lexical category of the target. On half the trials, the target and distracter were of the same lexical category (both words or non-words), and on the remaining trials they differed in lexical category. However, for no trial were target and distracter the same stimulus.

Subjects responded manually, identifying wordness of the underlined target stimulus using a response box placed at midline and aligned vertically. Subjects were instructed to depress one button if the target was a word, and another button if it was a non-word, using their index and middle fingers, respectively. Subjects responded in one of four different ways. One quarter of the subjects responded bimanually, with both hands simultaneously for each trial. One quarter of the subjects responded unimanually, with response hand switched between blocks of trials. One quarter responded with response hand congruent to visual field of presentation (left hand for LVF trials and right hand for RVF trials). Finally, the remaining subjects responded with one hand for words and the other for non-words, with hands assigned to each lexical category switched half-way through the experiment. Even though response instructions given to the subjects were very different, each response mode provided measures of word and non-word performance for LVF presentation with left hand response and RVF presentation with right hand response. We found that the response hand manipulation had no effect on performance for the task (Weems & Zaidel, submitted).

Stimuli were presented in four 120 trial blocks, with each stimulus presented once as target, and once as a distracter in each visual field. Brief rest periods were provided between blocks to reduce subject fatigue, with breaks lasting between 2 and 5 min. Each trial began 3 s after the previous stimulus was shown. Subjects were also given a 24 trial practice in which to familiarize themselves with the response box mechanism. Computer testing lasted approximately 30 min.

Data were analyzed by comparing performance on the lexical decision task with performance on the reading task. Fourteen lexical decision measures were targeted for comparison, based on the different cognitive

mechanisms believed to be associated with their performance:

- (1) LVF word accuracy
- (2) LVF word latency
- (3) RVF word accuracy
- (4) RVF word latency
- (5) LVF non-word accuracy
- (6) LVF non-word latency
- (7) RVF non-word accuracy
- (8) RVF non-word latency
- (9) Lexicality priming for words—accuracy
- (10) Lexicality priming for words—latency
- (11) Lexicality priming in LVF—accuracy
- (12) Lexicality priming in LVF—latency
- (13) Lexicality priming in RVF—accuracy
- (14) Lexicality priming in RVF—latency

While these measures are not all mutually exclusive (e.g., RVF lexicality priming and lexicality priming for words), they each provide different information regarding hemispheric specialization and interaction. Specifically, LVF/RVF word/non-word accuracy and latency were chosen to assess lexical decision performance when a single hemisphere is assigned greater relative task demands for the lexical decision. Lexicality priming measures in each visual field, and for words across visual fields, were chosen to provide a measure of hemispheric interaction, as described in Section 1 and in Iacoboni and Zaidel (1996). We define lexicality priming scores as the difference between congruent distracter condition and incongruent distracter condition. Thus, mean lexicality priming accuracy would equal (target word/distracter word accuracy – target word/distracter non-word accuracy) + (target non-word/distracter non-word accuracy – target non-word/distracter word accuracy). Correlations with reading performance were limited to these fourteen measures to reduce the possibility of Type I error based on multiple comparisons (28 observed correlations since each lexical decision measure is correlated with both vocabulary and reading comprehension performance). Correction due to multiple comparisons was used following the Larzelere and Muliak (1977) procedure for controlling family wise error rate in large correlational designs.

Stimuli were divided into two lists, with frequency (words only), orthography (words only), and length (both words and non-words) matched between lists. Stimuli in each list were shown once in each visual field, with the order (LVF then RVF; RVF then LVF) switched between subjects. Orthographic *N*, word frequency, and bigram frequency were matched between lists for words (orthographic *N*: 7.1 and 7.2; word frequency: 207, 209; and bigram frequency: 1439, 1343), and orthographic *N* (8.9 and 9.1) and bigram frequency (1489 and 1428) were matched for non-words.

Because of the reduced power encountered when examining data from male and female subjects separately,

we chose to collapse across sex in the current study. It should be recognized, however, that separate investigation of male and female performance may be fruitful, given the differing patterns of hemispheric interaction observed for these subjects.

3. Results and discussion

Vocabulary and reading comprehension measures were highly intercorrelated ($r = .74, p < .001$), with each predicting just over half of the other's variance (mean scores for these, as well as lexical decision performance measures, are provided in Table 1). Correlations between reading ability measures and lexical decision performance are presented in Table 2 and Fig. 1. Vocabulary was significantly positively correlated with both LVF word accuracy and LVF non-word latency. It is interesting that vocabulary should be so highly correlated with lexical decision performance in the

Table 1
Performance means

	Accuracy (%) [*]	Latency
LVF words	21.1	698.9
LVF non-words	13.8	736.1
RVF words	13.0	664.6
RVF non-words	11.9	716.5
Lexicality priming: words	1.2	-5.2
Lexicality priming: LVF	1.1	4.7
Lexicality priming: RVF	0.1	3.7
Vocabulary	84.5	
Reading comprehension	83.2	

^{*} Accuracy represented in percent error.

Table 2
Correlations between reading ability and lexical decision performance measures

	Vocabulary	Reading comprehension
<i>Accuracy</i>		
LVF words	.40 [*]	.30 [†]
LVF non-words	-.01	-.01
RVF words	.31 [†]	.30 [†]
RVF non-words	.11	.09
Lexicality priming: words	.33 [†]	.39 [*]
Lexicality priming: non-words	.08	.13
Lexicality priming: RVF	.30	.39 [*]
<i>Latency</i>		
LVF words	-.25 [†]	-.22
LVF non-words	-.41 [*]	-.34 [†]
RVF words	-.28 [†]	-.25 [†]
RVF non-words	-.38 [†]	-.41 [*]
Lexicality priming: words	.05	-.09
Lexicality priming: non-words	.24	.16
Lexicality priming: RVF	.09	-.02

[†] For $p < .05$ (uncorrected).

^{*} For $p < .05$ (corrected).

non-dominant hemisphere. However, there is strong indication that the right hemisphere is highly involved in the performance of linguistic tasks, even though the left hemisphere is often viewed as dominant. For example, Banich and Nicholas (1998) discuss how processing advantages may occur through the distribution of task processing responsibilities between the two hemispheres, even when one is clearly more adept for the task. Other work (Coslett & Saffran, 1998; Kinsbourne, 1998) also has suggested that the right hemisphere may play an important role in reading processes, particularly when enlisted by or released from inhibition from the left. There is also rich evidence for right hemisphere involvement in discourse (Tompkins, 1995). The observation of significant correlations between vocabulary and LVF word recognition is likely due to some (if not all) subjects' use of right hemisphere during linguistic processing. We might expect subjects who have more

linguistically competent right hemispheres to show both more accurate LVF word recognition and better overall word recognition ability (higher vocabulary scores). Thus, right hemisphere (LVF) word recognition performance becomes a useful measure for broader linguistic ability. Additionally, if all subjects use left hemisphere resources for word recognition but only

domain-specific codes linking form to meaning (e.g., lexical representation and semantics), the right hemisphere has equal access to code-independent meaning structures. Such structures may be especially important for vocabulary tasks that can be presumed to tap deep meaning for the words that is relatively independent of the code in which they are presented (e.g., written and verbal).

A right hemisphere contribution to vocabulary ability is also supported by varied work showing that the right hemisphere contributes to semantic access, albeit in a different manner than the left. Copland, Chenery, and Murdoch (2002) showed that left hemisphere damaged subjects accessed semantic meaning information resolving lexical ambiguity rapidly, but also activated multiple inappropriate meanings. Atchley, Story, and Buchanan (2001) further showed that patients with developmental language disorder showed deficits in subordinate word meanings (e.g., bank-river) for stimuli presented to the right hemisphere (LVF). These findings, along with other research (Grindrod & Baum, 2003; Waldie & Mosley, 2000), suggest that the right hemisphere provides strong, yet disperse, semantic association networks. In short, it appears that subjects who place greater responsibility on their right hemisphere for lexical processing show benefits in broader, more abstract skills such as semantic access.

Reading comprehension ability was also correlated positively and significantly with two measures of interhemispheric communication: lexicality priming for words and lexicality priming in the RVF. Iacoboni and Zaidel (1996) first described lexicality priming as an effective measure of interhemispheric communication during lexical decision. Although they observed greater lexicality priming effects for target words than target non-words, they also saw greater priming effects for LVF trials than RVF trials. Because only words are presumed to involve interhemispheric exchange for successful identification (Iacoboni & Zaidel, 1996; Mohr et al., 1994; Zaidel & Rayman, 1994), it is not surprising that lexicality priming effects are greater for these stimuli. The standard visual field asymmetries for lexicality priming are likely due to greater ease of left-to-right hemisphere transfer, which is likely to occur during lexical decision, since the left hemisphere is specialized for the task. However, in the current case, the correlation involved right to left hemisphere transfer, an important point to be addressed next.

The significant positive correlation between RVF lexicality priming and reading comprehension suggests that greater right-to-left interhemispheric communication leads to more efficient higher-level linguistic processing. Other work has shown that the right hemisphere is capable of performing insight and problem solving tasks (Baynes & Eliassen, 1998), and is highly involved in the drawing of inferences (Beeman, 1993) and meta-

phor interpretation (Brownell, Simpson, Bihrlle, Potter, & Gardner, 1990). Also, although the left hemisphere has been observed to play a greater role in other linguistic processes, such as ambiguity resolution, right hemisphere involvement increases as demands upon the semantic system increase (Beeman, 1993; Faust & Chiarello, 1998). It is likely, therefore, that the correlation between comprehension and lexicality priming is due to greater right hemisphere involvement for high performing individuals. The additional correlation between reading comprehension and lexicality priming for words further suggests that the lexicality priming for these stimuli is a good indicator of interhemispheric communication, and that such communication becomes increasingly important as the linguistic task becomes more complex.

Finally, a significant positive correlation between RVF non-word latency and reading comprehension suggests that the length of time it takes a subject to perform a lexical search is inversely related to his/her overall linguistic comprehension abilities. This follows from various models of word recognition that posit that non-word identification represents a failure of word recognition resources to detect a word and subsequent conclusion of the lexical search (Chiarello, 1988). In terms of sequential sampling models (e.g., van Zandt & Ratcliff, 1995), such failure results from a word detection counter failing to reach threshold before some variable time limit set by the observer. Since the lexical search ceases without successful word identification, a non-word response is made. In this way, mean non-word latency provides a useful measure of the subject-set time limit for the lexical search. This time limit may vary trial-by-trial, just as the mean time limit may also vary by subject. Consequently, not only does this latency measure a subject's presumed word detection time limit, it is also the case that variance of this time limit between subjects may provide important information regarding subjects' word detection abilities. As such, non-word latency provides unique information regarding one's word detection efficacy, since it represents a strategy based on intrinsic word recognition abilities rather than on trial-by-trial identification of words themselves. This interpretation also corresponds with the previously discussed finding that right hemisphere non-word latency, but not word latency, correlates with vocabulary performance. Following this reasoning, one might also expect high correlations with word accuracy in one or both of the hemispheres. Indeed, those correlations did reach significance before the Type I error was corrected, providing support for this theory.

A comparison of the correlations between both vocabulary and comprehension scores with accuracy and latency of lateralized performance provides some indication that the two lexical decision dependent measures tap different resources. Word accuracy in both visual

fields was correlated with both reading ability measures, whereas non-word latency in both visual fields was correlated with both reading measures (uncorrected). It appears, therefore, that word accuracy and non-word latency play special roles in measuring linguistic processing capabilities. For reasons described above, the latency measure may be especially important in measuring non-word identification performance since it measures time before the lexical search is completed. However, latency appears less important for word identification due to the relatively early time frame in which word recognition occurs (Weems & Zaidel, in preparation). Accuracy appears to tap different resources, and may be an effective measure of efficacy of lexical access, something applicable to words but not to non-words. Following this reasoning, we conclude that correlations between our reading measures and accuracy and latency performance are due to variance in lexical access efficacy and time/threshold setting for the lexical search, respectively. Further work examining the relationship between these lexical decision measures and broader cognitive tasks is necessary.

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