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DEVELOPING SECOND AND FOREIGN LANGUAGE READING FLUENCY AND ITS EFFECT ON COMPREHENSION: A MISSING LINK

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Abstract

Reading fluency has been a major concern in reading research and education in English L1 settings for the past three decades. Extensive research has explored various types of instructional methods to develop reading fluency in the hope of improving reading comprehension directly and indirectly as a result. Contrary to the increasingly important role reading fluency has been given in English L1 settings, it has attracted scant attention in L2 and FL settings because it is expected to grow naturally as reading skills develop. Some preliminary studies on reading fluency in L2 or FL contexts have directed the attention of researchers and educators to the issue of whether reading fluency plays a crucial role in successful reading comprehension, as opposed to fluency being a byproduct of reading skills development. This paper is an attempt to examine theoretical and pedagogical issues that address reading fluency in L2/FL settings. Based on research findings in English L1 and L2/FL settings, this paper also makes suggestions for future research and instruction.

What Fluency Is and Why It Is Critical for Successful Reading

Reading fluency has become a focal issue in English as a first language (L1) settings (e.g., Kuhn & Stahl, 2003; National Reading Panel, 2000). Fluency is thought to consist of both accuracy and automaticity in word recognition as well as the appropriate use of prosodic and syntactic knowledge for better comprehension of text (Grabe, 2004; Kuhn & Stahl, 2003; National Reading Panel, 2000). That is, fluent readers are able to identify words in text quickly and accurately with a minimal amount of attention. Word recognition is done efficiently and effortlessly and consequently, readers can read connected text silently or orally with speed and good comprehension. In addition, fluent readers are able to read aloud with appropriate

phrasing and expressiveness.

Rapid and automatic lower-level reading processing such as word recognition seems to be critical for successful reading comprehension. It is likely, however, that efficient processing of such lower-level skills is not the sole foundation of good reading comprehension. Background knowledge and higher-order comprehension skills, such as predicting, making inferences and monitoring ongoing understanding also influence readers' comprehension performance (e.g., Anderson & Pearson, 1984; Carrell & Eisterhold, 1983). Still, building automaticity in lower-level processes of reading is essential because it is unlikely that good readers lack well-developed word recognition skills (LaBerge & Samuels, 1974; Perfetti; 1985; Samuels, 1994; Segalowitz, 1991; Segalowitz and Segalowitz, & Wood, 1998).

Lower-level processing skills are particularly needed for second language (L2) or foreign language (FL) readers. Because of inefficiency in these skills, reading in a second or foreign language is usually a slow, laborious process (Anderson, 1999; Jensen, 1986; Segalowitz, Poulsen, & Komoda, 1991). Furthermore, this dilemma may point to motivational problems for learners in L2/FL contexts in regards to utilizing reading as a significant source of linguistic input, a critical issue in settings where reading may constitute the sole source of linguistic input available to learners (Gebhard, 1996; Redfield, 1999). Nuttall posits a "vicious circle" to describe readers who cannot develop good reading skills (1996, p. 127). Slow readers do not read much, and if they do not read much, they do not understand. If they do not understand, then they cannot enjoy reading. Day and Bamford (1998) note that it is only through the actual reading experience that L2 or FL readers can acquire the complex linguistic, world, and topical knowledge needed to improve their reading skills (p. 19). Therefore, for theoretical and pedagogical reasons, L2 and FL researchers and educators indicate the need to find effective methods to help L2 and FL learners develop their reading fluency (Day & Bamford, 1998; Grabe, 1991, 2004; Silberstein, 1994).

Automaticity Theory & Verbal Efficiency Theory: Theoretical Support for Developing Reading Fluency

The critical role fluency plays in efficient and successful reading is based upon two theories of reading called Automaticity Theory (LaBerge and Samuels, 1974; Samuels 1994) and Verbal Efficiency Theory (Perfetti, 1985, 1988). Both theories are based on the notion that the attention resource capacity that readers can allocate at one time is limited (Benjafield, 1997; Daneman & Carpenter, 1980, 1983; LaBerge & Samuels, 1974; Schneider & Shiffrin, 1977). Automaticity Theory (AT) posits that part of the reading process should be executed with a slight amount of attention to achieve successful reading comprehension. Reading is a complex process, and at the "bottom" of reading processes are letter feature extraction, orthographic segmentation, and phonological coding. The end result of these processes is lexical access or word recognition in which readers identify the meanings of words in text. Beyond lexical

access is comprehension of sentences, paragraphs, and entire passages. During these comprehension processes, readers engage in literal and inferential comprehension of texts and monitor whether they are successfully comprehending. According to AT, comprehension processes are consistently and inordinately resource-demanding, so educators should aim at helping learners automatize lexical access through a great amount of repeated exposure to print. Only when readers execute word recognition fast and automatically without using much of their attentional resources, can they utilize most of their attentional resources to achieve better comprehension.

Verbal Efficiency Theory (VET) proposed by Perfetti (1985, 1988) also focuses on automaticity in decoding. While AT confines the notion of automaticity to decoding processes, VET expands the notion beyond lower-level decoding processes (Walczyk, 2000). VET theorizes that even higher-level reading processes beyond lexical access, such as resolving anaphors, integrating propositions, using basic cognitive and metacognitive strategies, and activating relevant background schemas, can be automatized through extended practice. The theory presumes a hierarchy among individual reading process subcomponents. At the basic process of lexical access is letter identification, and beyond that is word recognition. The term "verbal efficiency" refers to the degree to which readers' subcomponents of reading are exercised with speed and accuracy. It is theorized that the more efficient lower-level subcomponent reading processes are, the more attentional resources are available for higher-level subcomponents of reading by ensuring better quality of information transmission from lower- to higher-level subcomponent processes. In other words, if readers are quick and accurate in identifying words, they will have more attentional resources for executing resource-demanding reading comprehension. On the other hand, readers with poor decoding skills expend most attentional resources on decoding processes, not for higher level comprehension processes. Consequently, these readers are less efficient at retaining information in their working memory to integrate propositions and generate inferences in order to make meaningful representations of text. Comprehension will suffer as a result.

As discussed above, both Automaticity Theory and Verbal Efficiency Theory suggest a critical role for reading fluency in successful reading. According to Automaticity Theory, once readers have achieved automaticity in lower identification skills such as decoding and word recognition, their lexical access proceeds smoothly even without their being aware of the process. That is, most of their attentional resources are being allocated to higher-level comprehension processes, which inevitably leads to improved comprehension. Verbal Efficiency Theory differs from AT in that it suggests the possibility that some of the post-lexical access processes of comprehension, such as identifying important elements in the text, integrating propositions, resolving anaphors, and activating relevant schemas from memory, can be automatized. These differences provide interesting yet distinct perspectives to researchers who explore the relationship between word recognition and reading

comprehension, as is discussed below. To facilitate this discussion, we first need to outline an established reading fluency development method, Repeated Reading, as used in L1 and L2/FL contexts. Research done using Repeated Reading has suggested the importance of exploring the relationship between word recognition and comprehension.

Repeated Reading in L1 Settings

Repeated reading (RR) was devised by Samuels (1979) to translate Automaticity Theory (LaBerge & Samuels, 1974) into practice. Thus it is a method that aims to develop the fluent word recognition skills of readers. With extensive RR practice, readers are expected to be able to direct most of their attentional resources to higher order comprehension processes. Thus, their comprehension improves. Samuels' original method called for readers to re-read a series of short passages orally until they were able to read at a words-per-minute level set for varying proficiency levels of readers. Currently there are several variations of RR extant. One is unassisted RR which does not involve a reading model; another is assisted RR which uses a live or audiotaped model of reading. Among the assisted repeated reading programs are the Neurological Impress Method (Heckleman, 1969) and the Reading-While-Listening Method (Carbo, 1978; Chomsky, 1976; Rasinski, 1990). The Neurological Impress Method involves rapid paired reading by the teacher and students, while Reading-While-Listening allows students to read continuous text along with a taped version of the text. The RR method has been extensively studied in English in L1 contexts and overall has been shown to be effective in developing reading fluency and comprehension of monolingual readers of English (see Kuhn & Stahl, 2003; National Reading Panel, 2000 for reviews of studies on RR in English L1 settings).

Indeed, the research findings suggest that re-reading passages increases students' oral reading rates and accuracy (Carver & Hoffman, 1981; Chomsky, 1976; Dahl, 1974; Dowhower, 1987; Herman, 1985; Rashotte & Torgesen, 1985; Samuels, 1979; Young, Bowers, & MacKinnon, 1996). This in turn leads to better comprehension of passages (Dowhower, 1987; Herman, 1985; O'Shea, Sindelar, & O'Shea, 1985; Young et al., 1996). In addition, practice effects from re-reading a passage are carried over to new, unpracticed passages in terms of reading rate and accuracy (Carver & Hoffman, 1981; Dowhower, 1987; Faulkner & Levy, 1994; Herman, 1985; Rashotte & Torgesen, 1985; Samuels, 1979) and comprehension (Dowhower, 1987; Morgan & Lyon, 1979; Young et al., 1996). RR has a positive effect on readers' vocabulary development (Koskinen & Blum, 1984), and seems to enable readers to read in larger and more syntactically and phonologically appropriate phrases (Dowhower, 1987). It has been noted, however, that unless the degree of overlapping vocabulary between old and new passages is high, transfer of gains to the new passage is minimal in terms of reading rate (Rashotte & Torgesen, 1985).

Repeated Reading in L2/FL Settings

Developing fluency in L2/FL reading has become a significant and salient issue for pedagogy in L2 settings (Grabe & Stoller, 2002; Nation, 2001). However, there has been scant research on reading fluency training, and "L2 reading research should explore the best conditional practices that would support reading fluency development and at least provide indirect support for reading comprehension improvement" (Grabe, 2004, p. 56).

Repeated reading is a recent reading fluency development approach in L2 or FL settings. In RR, L2 readers repeatedly read specified passages from relatively easy texts in order to increase their sight recognition of words and phrases. RR can be an effective method to help L2/FL readers build reading fluency and better comprehension (Blum, Koskinen, Tennant, Parker, Straub, & Curry, 1995; Dlugosz, 2000; Taguchi, 1997; Taguchi & Gorsuch, 2002; Taguchi, Takayasu-Maass, & Gorsuch, 2004). There have been relatively few empirical studies on RR in L2 and FL settings, however, and even fewer on how RR affects comprehension. Blum, Koskinen, Tennant, Parker, Straub, & Curry (1995) investigated whether home-based repeated reading with an auditory model (audio cassettes) was an effective supplement to an L2 literacy program. They concluded that repeated reading improved the readers' ability to fluently and accurately read books of increasing difficulty. Significantly, readers also reported through a survey that RR enhanced their motivation to read, which is, as noted above, a critical issue in L2/FL settings where reading may constitute a significant source of linguistic input.

Taguchi (1997) examined the effects of RR on English oral and silent reading rates of 15 Japanese university students learning English as FL. The ten-week study stipulated 28 in-class RR sessions. In each session they read a passage silently seven times. Three of those times, they read while listening to an audiotaped model of the passage. Taguchi found that silent reading rates increased significantly even at the seventh reading within the practiced passages, and that there was no leveling off of reading rate increases. However, when the readers were asked to silently read or read aloud new passages, they did not transfer their increased reading rates to the new passages. There was one exception: The lowest-level readers showed a significant improvement in their oral reading rate of new passages.

Motivated by Taguchi's results, Taguchi & Gorsuch (2002) focused on RR transfer effects for silent reading rate and comprehension to new passages. Their results were inconclusive. They found that the ten-week RR program significantly improved the nine participants' reading rates from a pre-test reading passage to a post-test reading passage (a different passage). However, reading rate gains from the first RR session passage to the final (28th) RR session passage approached but did not exceed the critical value set for statistical significance. In addition, control (non-RR) and experimental (RR) group participants showed similar and modest transfer gains for reading comprehension from the pre-test to the post-test. Taguchi & Gorsuch speculated that the lack of clear transfer effects for reading rate and comprehension of RR group readers may have been caused by the shortness of the treatment period (only ten

weeks).

As a follow-up to the study by Taguchi & Gorsuch (2002), Taguchi, Takayasu-Maass, & Gorsuch (2004) explored the effects of assisted repeated reading on silent reading rates and comprehension by stipulating a longer RR treatment period. They compared two methods of repeated reading and extensive reading (ER), both of which were considered effective to develop silent reading fluency and comprehension in L2 and FL settings (e.g., Day & Bamford, 1998). The RR treatment period was extended from 10 weeks to 17 weeks, and the total number of RR sessions from 28 to 42. They found that assisted repeated reading significantly improved students' silent reading rates from the first to the forty-second session. They also found that, on average, the students read significantly faster within individual RR sessions. In other words, they read faster, on average, from their first to their fifth reading of any given passage. As for gains in reading comprehension, however, they were not able to detect transfer effects from the repeated reading treatment. This turned their attention to developing more sensitive and reliable reading comprehension measures, which have been employed in a recent RR project, conducted in Vietnam.

Adding to the quantitative data from reading rate estimation and comprehension test scores, Taguchi, Takayasu-Maass, & Gorsuch (2004) also explored participants' perceptions of the effectiveness of the two methods. This qualitative data was collected using a questionnaire and free comments participants made on their reading time reporting sheets. Participants in both RR and ER groups reported that the respective methods they had used increased their willingness to read long passages and developed their ability to deal with unknown words. They also reported that RR and ER provided them with a substantial amount of FL input, and promoted their vocabulary growth through reading. More interestingly, participants' comments illuminated features that are unique to RR. Those who engaged in assisted repeated reading suggested that repetition, a key component of repeated reading, and the use of an auditory model of the texts being read, contributed to better reading comprehension of the treatment passages. This suggests that these unique components of RR provided some scaffolding for the beginning-level participants, thus keeping them motivated and engaged in enjoyable reading throughout the treatment period (Feitelson, Goldstein, Iraqui, and Share, 1993; Vygotsky, 1978).

To summarize, RR seems to help readers in L2/FL develop silent reading fluency, but its effects on reading comprehension remain to be demonstrated, requiring attention in future research (for further discussion, see the section on "Problems with the past RR studies in L2/FL settings" below). This gap is intriguing, as discussed below, and may lead us to better understanding the role of improved word recognition in successful reading comprehension.

Does Improved Word Recognition Alone Lead to Improved Comprehension Or Is It Simply One of the Enabling Components?

Automaticity Theory suggests that automatic word recognition frees readers from expending their attentional resources on word recognition. Consequently, readers should be able to apply most of their attention to facilitate higher order comprehension processes, thus improving comprehension. Some RR studies in English L1 settings, however, have failed to show that reading fluency gains from RR treatments necessarily lead to improved reading comprehension (e.g., Carver & Hoffman, 1981; Dahl, 1979; Mathes & Fuchs, 1993). This finding runs counter to AT, as AT suggests that if improved automatic word recognition comes hand in hand with improved comprehension, then training students to identify isolated words faster and more accurately should result in better comprehension. In some studies in English L1 settings, students practiced reading lists of words that constituted the connected texts they were later tested on for reading comprehension. Studies by Fleisher, Jenkins, & Pany (1979) and Spring, Blunden, & Gatheral (1981) found that word recognition training significantly enhanced single word decoding speed, but there were no concomitant gains in reading comprehension. In contrast, recent studies by Levy, Abello, & Lysynchuk (1997) and Tan & Nicholson (1997) suggested that single word training does lead to improved decoding speed in isolated words and in connected text, and *also* improved reading comprehension. Using more intensive training and learner-appropriate level test passages, both studies replicated the study by Fleisher et al. (1979), and their findings lent support for Automaticity Theory. That is, automatic word recognition skills seem to be associated with better comprehension.

In a recent study in English L2 settings, Fukkink, Hulstijn, & Simis (2005) also looked at the relationship between word recognition and reading comprehension. They studied the effects of training on word recognition skills with a population of Grade 8 Dutch-speaking students ranked at an intermediate level of L2 English. Using two computer-mediated training experiments, they focused on the training effects in areas of speed and automaticity in word recognition skills, reading rates, and comprehension of text. They found the training developed the L2 readers' speed in isolated words recognition skills. There was, however, no transfer effect of the word recognition training on reading speed or comprehension of the connected test passages.

Thus, it remains to be consistently demonstrated in L2/FL reading research that automated word recognition skills are a sufficient condition for successful reading comprehension. Rather, automatized word recognition skills are a necessary, but not sufficient, condition for good reading comprehension (Fleisher et al., 1979, p. 33). This begs the question of whether training L2/FL readers in word recognition skills would ensure better comprehension or whether word recognition is only one of the subcomponents of reading necessary for good comprehension, and thus only part of the equation to be addressed by reading instruction. There has been no research to date that has shown a causal relationship between improved word recognition skills

and enhanced reading comprehension in L2/FL settings (Fukkink et al., 2005; Taguchi & Gorsuch, 2002; Taguchi, Takayasu-Maass, & Gorsuch, 2004).

While the L2/FL reading research has not yet found robust support for Automaticity Theory, Verbal Efficiency Theory seems to propose an explanation as to why improved word recognition does not necessarily lead to improved comprehension. In other words, VET possibly explains the lack of support for a causal relationship between word recognition and comprehension. It does this by extending the notion of automaticity from pre-lexical access to post-lexical access processes of reading. VET suggests that word recognition is a critical reading subcomponent of successful reading, and furthermore, basic post-lexical access processes of reading can be automatized through practice. That is to say, good readers engage in automatic processing in terms of pre-lexical word recognition and post-lexical processes such as syntactic parsing and proposition integration. Such readers even use reading strategies such as looking at headings and subheadings, and attending to topic sentences and other important elements in the text to assist their comprehension. Readers who have improved word recognition skills but lack efficient basic comprehension skills (automatized post-lexical processes) are not able to utilize what attentional resources they have been able to free up to assist their comprehension. Fukkink et al. (2005) suggest a possible reason for the absence of a transfer effect that is supportive of this position. They speculate “that the role of fluent lexical access in L2 reading is too small to expect significant changes in higher order reading comprehension in view of the complex nature of the reading process” (p. 71).

This extended notion of automaticity beyond decoding is also suggested by some studies in English L1 settings. It has been shown that readers are able to comprehend better when provided with texts segmented by phrase units, a larger discoursal unit than single words (Cromer, 1970; O’Shea & Sindelar, 1983). Kuhn & Stahl (2003) argue that while repeated reading and parsing (chunking) texts into phrase units both seem to facilitate readers’ comprehension and fast isolated word recognition does not, it is very likely that more than automaticity and accuracy in word recognition is needed to significantly contribute to successful comprehension. Based on this argument, they emphasized the role of prosody in achieving better comprehension (p. 18), something likely provided by assisted RR, where an audio model of the text is heard by readers as they read. They argue that phrase boundaries marked by prosodic information in English L1 reading contexts contributed to better comprehension performance by the readers.

This extended notion of basic post-lexical process automaticity is also favored by L2/FL reading researchers. Grabe and Stoller (2002), for example, suggest that in addition to pre-lexical word recognition, fast and automatic syntactic parsing, which is thought to be a post-lexical process, is a critical lower-level subcomponent of L2 reading. That is, L2 readers’ ability to recognize grammatical structure in sentences, and identify what pronouns and definite articles refer to is important to their comprehension of text (pp. 22-23). They also

insist that L2 readers must be exposed to print extensively and intensively before they develop automatic syntactic parsing skills.

Unlike English L1 readers, who have tacit grammar knowledge and a tremendous amount of vocabulary knowledge even before they start learning to read, L2/FL readers are generally not exposed to the large amount of text in L2/FL necessary to develop automatic word recognition and some basic post-lexical access comprehension skills (Grabe & Stoller, 2002; Koda, 1996). More attention should be expended to developing reading fluency in L2/FL readers, thus increasing their exposure to text, which is thought to be necessary to automatize lower order pre- and post-lexical access processes. Grabe (2004) emphasizes the need by noting:

> Research on the effects of word recognition fluency training on comprehension development is a relatively new area and multiple studies are needed. It will take time for the real impact of fluency on comprehension to be sorted out (a) for different groups of L2 (and L1) students, (b) in different settings, (c) with different amounts of training, (d) with different training tasks, (e) with different assessment measures, and (f) with differing amounts of overall exposure to the L2 (p. 48).

Some Problems with the Previous RR Studies in L2/FL Settings

It is necessary to discuss how research in L2 and FL settings might be improved to operationalize the insights on reading fluency offered by VET. In spite of an insistent call for further research on reading fluency development and its impact on reading comprehension in L2/FL settings, there are few studies that have explored the issue to the present. Taguchi & Gorsuch (2002) and Taguchi, Takayasu-Maass, and Gorsuch (2004) are rare attempts to address the issue. Both studies, however, had shortcomings. One problem was the lack of sensitive and reliable reading comprehension measures. In Taguchi and Gorsuch (2002), a pair of test forms (4A and 4C of the Ekwall/Shanker Reading Inventory: Shanker, Ekwall, & Ekwall, 1993) were used as a pretest and posttest. It was found that there was a discrepancy in the readability estimates between these test passages and the texts used for the RR treatments. Taguchi and Gorsuch used the average readability scores of the Flesch-Kincaid, Fog, and Fry formulae to estimate the difficulty levels of the test and treatment passages, and their calculations indicated the test passages were more difficult than the RR treatment passages. Additionally, it is possible that the test items based on the test passages were not sensitive enough to detect any gains from the RR treatment. The pretest and posttest used in the study by Taguchi, Takayasu-Maass, & Gorsuch (2004) were also found not to be equal. Forms A and B of a U.S. fourth grade level passage in the Burns/Roe Informal Reading Inventory (Burns & Roe, 1999) were used in this study as pretest and posttest. The equivalent forms reliability coefficient was estimated by administering the pretest and posttest to two different groups of students in the same school, whose English language proficiency was similar to the study

participants. One group took the pretest first and then the posttest, and for the other group the order was reversed. The reliability estimate was not found to be equal in terms of words per minute and comprehension scores. The results indicated that the two test passages were not equal when used with the non-native English speaking participants even though these tests are considered to be equal for English L1 readers.

Another possible problem is with the short-answer test format. In the test-taking sessions, students read each test passage five times, and their comprehension was measured after their first, third, and fifth readings of the passages (the students were not allowed to refer to the test passages for answering the questions). It was evident from the successive test results that the students in both studies had great difficulty in processing information in the text during their first reading of the test passages. In the Taguchi et al. (2004) study, the mean comprehension score of the RR group participants for their first reading was 1.60 (*SD* = 2.32, *K* = 16), and it was 3.90 (*SD* = 3.35, *K* = 16) on the posttest. Their comprehension scores after the first reading were only 10% on the pretest and 24.4% on the posttest. After their fifth reading of the test passages, however, their mean scores increased to 6.50 (*SD* = 4.60) on the pretest and 8.80 (*SD* = 2.53) on the posttest. That was 40.6% on the pretest and 55.0% on the posttest. Considering that the participants' comprehension scores on the pretest improved from 10% to 40.6% after their fifth reading, and their scores on the posttest from 24.4% to 55.0% after their fifth reading, we surmise the students were able to understand the test passages. There would have been no increases if they had not understood the passages. We conclude it was inefficient processing during their first reading of the test passages, not the difficulty level of the tests, that was responsible for their low scores. The short-answer test format may not have been suitable for measuring gains in the beginning-level students' reading comprehension because they primarily aimed to assess the participants' grasp of details contained in the passages. Other reading comprehension measures such as free recall or gist and detail recall might have been more sensitive to gains in comprehension. In a study currently underway, Gorsuch and Taguchi utilize short answer items and recall protocols designed to capture comprehension of details, supporting details, and main ideas.

In addition to improving the reliability and validity of test instruments, future research should also take into account that the pattern of fluency development can be consistent in the long term, but that fluency develops quite slowly and its pattern of progress will fluctuate greatly in the short term. In both of the studies by Taguchi & Gorsuch (2002) and Taguchi, Takayasu-Maass, & Gorsuch (2004), a considerable amount of fluctuation (both increases and declines) was observed in silent reading fluency words-per-minute estimates, and these fluctuations grew in magnitude over the entire treatment period. Only after extending RR sessions from 28 to 42, were Taguchi, Takayasu-Maass, & Gorsuch (2004) able to detect significant transfer gains from RR treatments to new, unpracticed passages. It seems to take beginning-level English L2/FL readers a considerable amount of time and intensive and

extensive practice before their fluency develops, at least in terms of silent reading rate. Therefore, reading fluency is generally slow to develop as some reading researchers have suggested (Grabe, 2000, 2004; Kuhn & Stahl, 2003; National Reading Panel, 2000; Segalowitz, 2000). Future studies should take this into account, and employ intensive and extensive reading fluency development protocols.

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