Incidental Vocabulary Learning in a Multimedia Format: The Effect of Different Types of Glosses on Vocabulary Learning of Iranian Students.

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Abstract

Computer Assisted Language Learning known as CALL has gained sustained attention in the field of second language vocabulary learning. Various instructional techniques have been used in order to make learners learn words incidentally in reading comprehension texts, one of which is glossing target vocabulary in a computerized format. In order to investigate the effectiveness of these glosses in a multimedia setting, 120 students were recruited. They were divided into six groups, three of which read the texts in a multimedia setting and the other three read them in traditional classes. The groups had access to L1, L2, and multiple choice glosses respectively and were asked to read different texts enhanced with glosses. After reading the texts, students were asked to answer two vocabulary tests in order to measure their learning and retention. The results of independent sample t-test showed that participant in multimedia groups outperformed the traditional groups significantly. The results also indicated that multiple choice groups in both traditional and multimedia formats had better effects on students learning and retention. The results of a one- way ANOVA revealed that multiple choice group in multimedia format outperformed the other groups significantly. Students in this group were provided with the feedback for their answers, and provision of feedback made them more conscious and involved in the process of learning.

Keywords: **Glossing; Incidental Vocabulary Learning; Multimedia Environment**

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1. Introduction

Vocabulary is the core aspect of second language learning. Nation (2001) asserts that lexical knowledge is a key to enhance the quality of listening, speaking, reading, and writing of learners. The process of vocabulary learning is considered as one of the most difficult processes of language learning in which the burden of leaning words of a language makes learners frustrated and impedes the process of learning. As a result, enlarging vocabulary knowledge is one of the major concerns of learners and their teachers (Tabatabaei & Shams, 2011). Teachers want to find the most appropriate ways of teaching vocabulary in order to help their students cope with this burdensome vocabulary learning process. There are a large number of controversial theories about vocabulary learning in the field of language teaching. The traditional methods of language teaching worked on long lists of vocabulary with their translations (Read, 2000). Gradually, with the advent of communicative approaches of language teaching, the idea of rote learning vanished and gave way to new techniques and methods of teaching and learning vocabulary among which incidental vocabulary learning has gained a considerable amount of attention.

Research shows that children vocabulary acquisition takes place incidentally while learners' attention is somewhere else (Huckin & Coady, 1999). Many scholars believe that incidental vocabulary learning is more appropriate and efficient (Horst, 2005; Huckin & Coady, 1999; Rott, Williams, & Cameron, 2002; Webb, 2008; Web, Newton, & Change, 2013) compared with other types of learning. Decarrico (2001) describes it as "learning that occurs when the mind is focused elsewhere, such as on understanding a text or using language for communicative purposes" (p. 289). Incidental vocabulary learning and reading comprehension are closely related (Laufer, 1992). Stahl (1983) demonstrates their relationship as "one of the best documented relationships in reading research" (p. 33). As a result, many different techniques have been used in order to bring reading programs in language classes.

Therefore, Reading can provide learners with opportunities to learn many words incidentally; however, this process may be a slow one. In order to increase the speed of learning and to provide a more comprehensible input for learners, provision of extra information in form of glosses were suggested (Hulstijn, 1992; Watanabe, 1997). The overall positive effect of these glosses has been shown through the many years of research (Hulstijn, 1992; Hulstijne, Hollander, & Greidianus, 1996; Jacob, Dufan, & Hong, 1994; Yoshi, 2006, 2013; Zhang, 2007), now according to Yoshi (2006) there is a shift of direction as which type of gloss has a more significant effect on students vocabulary learning. By means of glossing, teachers can arise learners' attention. Schmidt (1990) argues that in order to learn new words, learners should first notice them in some sense.

Nation (2001) defines glosses as simple translations of unknown words which are usually presented in margin of the texts, and which help learners notice them. In the present study the three types of glosses namely L1, L2, and multiple choice, are used. As the name suggests, L1 glosses provide learners with L1 equivalents, L2 glosses provide learners with L2 definitions, and multiple choice glosses provide learners with some options to choose from, which is based on Laufer and Hulstijn's (2001) Involvement load hypothesis. The main belief concerning this hypothesis is that deep thinking and inferring the meaning from context need some degrees of

mental effort which causes better learning. There exist some inconsistencies in the literature considering the effects of different types of glosses, however. Some scholars argue that there are no differences among different types of glosses, and they all have a positive effect on students' incidental vocabulary learning (e.g., Jacob et al., 1994; Ko, 2012; Zarei & Gilanian, 2013; Zarei & Mahmoodzadeh, 2014). Some others, on the other hand, found the superiority of one type over other types (e.g., Miasako, 2002; Nagata, 1999; Rott, 2002; Watenab, 1997; Yoshi, 2013). Therefore, additional research is needed for investigating glossing. Providing such materials in a computerized format can bring about different results as well. Computer- Assisted Language Learning known as CALL is a matter of concern these days and many researchers are endorsing the use of computers as an essential component in language learning and teaching. The advent of new technology to the field of language learning has provided learners with host of materials in second language and investigating the differences between traditional and computerized format can illuminate some lines of research for material developers, teachers and learners to find some suitable ways for learning vocabulary.

The following research questions are proposed:

1. Is there any significant difference in students' rate of vocabulary learning in the traditional and multimedia settings?
2. Which type of annotation does have a better effect on students' short term vocabulary learning?
3. Which type of annotation does have a better effect on students' long term retention?

2. Method

2.1 Participants

For the purpose of data collection, a total of 120 students were recruited. Their age ranged from 15-18, and they were all Farsi native speakers. An Oxford Placement Test (OPT) was administered to check their language proficiency homogeneity. All participants were assured about the confidentiality of their responses.

2.2 Materials and Instrumentation

Different materials and instruments were used for the purpose of data collection, namely, Oxford Placement Test, reading texts, glosses, auto play media studio, pretest, and posttest.

2.2.1 Oxford Placement Test

For homogenizing students in terms of language level, an Oxford Placement Test devised by Edward (2009) was administered. The test consists of 60 multiple choice questions for assessing vocabulary, grammar, and reading comprehension. Those students who scored about one standard deviation above and below the mean were selected as the target participants of the study. The reliability of the test was checked in a pilot group and it was about .08 which is acceptable for the purpose of data collection.

2.2.2   Reading Texts

Seven different reading texts were selected from "Select Reading" pre-intermediate series. Their readability levels of which were checked by means of Flesch-Kincaid readability formula.

2.2.3   Glosses

Great cautions were forced on the selection of target items of the study since the selected words should not be part of prior knowledge of students. Forty one words based on the results of two pilot studies were selected from the reading texts as the target items of the study in order to be investigated in the posttest.

2.2.4   Auto play Media Studio

For the purpose of providing the computerized versions of materials, auto play media studio which is a user-friendly software for producing auto run materials was used.

2.2.5   Pre Test

In order to make sure that students have no knowledge of the selected vocabulary items, a pretest was used in the pilot group, in which students were to write down as many meanings as they know for the selected items.

2.2.6   Post Test

In the end, students were to answer a vocabulary posttest in order to measure their vocabulary gain. This study concerns about measuring productive vocabulary knowledge, so vocabulary knowledge scale prepared by Paribakht and wesche (1997) was used. The same measure was used after two weeks to check their retention.

2.3 Procedure

For the sake of selecting target items of the study, two pilot groups were recruited. In the first pilot group, twenty students were asked to read the texts and underline the unfamiliar items. The selected words were then checked in another pilot group in which participants were to write down the meaning of words in first or the second language. The words that were unknown for about 75 percent of participants were selected to be part of the study. Among the selected words, those words that did not have polysomic meanings were excluded from the study. All the target words were content words. In order to prepare texts in computerized format, Auto Paly Media Studio software was used. The selected items in computerized formats were in form of hypertext. One week prior to the study,

participants were asked to complete OPT in order to create homogeneous samples and those participants who scored about one standard deviation above and below the mean were selected.

After Selecting target participants by means of OPT, Learners were divided into six different groups. The six classes were randomly assigned to the conditions of the study. Three groups read the texts in a traditional setting and the other three read them in computerized environment. The first groups in each of traditional and multimedia groups had access to L1 glosses. The second groups, on the other hand, had access to L2 definitions which were selected from Oxford English Dictionary. The third groups were provided with multiple choice glosses in which students were to choose one correct option out of the two provided options. In computerized format students were provided with feedback as well which means if they choose the wrong option, they will become informed and they should select the other option. The selection of options were based on polysemy. In the final session after reading all the texts, learners answered the first posttest. The same measure was used after two weeks to investigate words retention.

3. Results and Discussion

In order to see whether there exist any significant differences between the traditional and CALL groups, an independent sample t-test was run. The results indicate the superiority of CALL group over traditional group.

Table 1. Descriptive Statistics of the Independent Sample t-test.

	Group	N	Mean	Std. Deviation	Std. Error Mean
test1	traditional group	60	109.97	24.822	3.205
	computerized group	60	136.52	22.226	2.869

Table 2. Independent Sample t-test Results.

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
test1	Equal variances assumed	.030	.862	-6.172	118	.000	-26.550	4.301
	Equal variances not assumed			-6.172	116.588	.000	-26.550	4.301

The results are in tune with some other previous studies conducted in this area (e.g, Davis & Lyman-Hager, 1997; Yoshi & Flaitz, 2002). Davis and Lyman-Hager (1997) pointed out that the computerized versions of glosses have the advantage of being hidden from the readers and; therefore, they do not interrupt the process of reading. They can be visible just by clicking on them and can facilitate vocabulary learning better. Yoshi and Flaitz (2002) say that in multimedia setting, glosses are available to learners at their requests. Learners are not confused with host of extra information provided for them, and they can consult with this extra information in case they need. The descriptive statistics of performance of each of groups in the first posttest are displayed in the table 3.

Table 3. Descriptive Statistics of One-way Anova.

	N	Mean	Std. Deviation	Std. Error
NonCALL1	20	96.55	28.237	6.314
Non CALL L2	20	112.35	19.443	4.348
Non CALL MC	20	121.00	20.355	4.551
CALL L1	20	121.85	16.220	3.627
CALL L2	20	136.35	23.674	5.294
CALL MC	20	151.35	15.885	3.552
Total	120	123.24	26.983	2.463

As it is illustrated in the table, the highest mean belongs to CALL multiple choice group, and the lowest mean goes to NONCALL L1 group. For showing that the differences among all six groups are significant, a one way ANOVA was run. Since the results were significant, the results of the post hoc tuckey were also checked.

Table 4. One Way Anova for the First VKS.

test1					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	35998.842	5	7199.768	16.206	.000
Within Groups	50645.150	114	444.256		
Total	86643.992	119			

As it is illustrated in the table 5, the CALL multiple choice group outperformed all NONCALL groups. The Non CALL multiple choice gloss group outperformed all other non-CALL groups. Therefore, the results indicate the superiority of multiple choice gloss groups in both CALL and non-CALL settings. Such results are due to the fact that students in these groups are required to choose among provided options which may make them more involved in the process of learning and enhance learning (Laufer & Hulstijn, 2001). Learners in CALL group are provided with feedback which decrease the amount of wrong guesses and increase learning (Nagata, 1999). According to

Laufer and Hulstijn (2001) provisions of multiple choice glosses provide learners with three elements of need, search and evaluation which are prerequisite for learning. Learners should first perceive the need for learning and then search for the meaning themselves. Finally they can evaluate their responses. The results of this study are in line with Laufer and Hulstijn's theory. There exist some contradictory results concerning multiple choice glosses in the literature, however.

Watenab (1997) and Wang (2005) found no significant differences between single slot and multiple choice groups. The insignificant results may be due to the fact that many students in multiple choice group have chosen a wrong answer among provided options and the wrong meanings have been fossilized. Wang (2005) concluded that the retained items in single slot group decrease more quickly, and he attributed single slot glosses to short-term memory. Hsu (2011) conducted the same study in which the options of MCG group were provided in L1, as well. He attributed the non-significant results of his study to unclear nature of intervention for learners. He argued that learners did not understand that there were incorrect options present. İn this study, learners who had access to L1 glosses had the lowest mean score. This is due to the fact that students in L1 group did not pay attention to the words deeply, as a result their learning rate is limited (Miasako, 2002).

Table 5. Post hoc Tukey for the First VKS.

(I) group	(J) group	Mean Difference(IJ)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
noncallL1	nonCALLL2	-15.800	6.665	.176	-35.12	3.52
	nonCALLMC	-24.450*	6.665	.005	-43.77	-5.13
	CALLL1	-25.300*	6.665	.003	-44.62	-5.98
	CALLL2	-39.800*	6.665	.000	-59.12	-20.48
	CALLMC	-54.800*	6.665	.000	-74.12	-35.48
noncallL2	noncallL1	15.800	6.665	.176	-3.52	35.12
	nonCALLMC	-8.650	6.665	.786	-27.97	10.67
	CALLL1	-9.500	6.665	.712	-28.82	9.82
	CALLL2	-24.000*	6.665	.006	-43.32	-4.68
	CALLMC	-39.000*	6.665	.000	-58.32	-19.68
NoncallMC	nonCALLL1	24.450*	6.665	.005	5.13	43.77
	nonCALlL2	8.650	6.665	.786	-10.67	27.97
	CALLL1	-.850	6.665	1.000	-20.17	18.47
	CALLL2	-15.350	6.665	.201	-34.67	3.97
	CALLMC	-30.350*	6.665	.000	-49.67	-11.03
CALL L1	nonCALLL1	25.300*	6.665	.003	5.98	44.62
	noncallL2	9.500	6.665	.712	-9.82	28.82
	nonCALLMC	.850	6.665	1.000	-18.47	20.17
	CALLL2	-14.500	6.665	.257	-33.82	4.82
	CALLMC	-29.500*	6.665	.000	-48.82	-10.18
CALL L2	nonCALLL1	39.800*	6.665	.000	20.48	59.12

	nonCALLL2	24.000[*]	6.665	.006	4.68	43.32
	nonCALLMC	15.350	6.665	.201	-3.97	34.67
	CALLL1	14.500	6.665	.257	-4.82	33.82
	CALLlMC	-15.000	6.665	.223	-34.32	4.32
CALL MC	nonCALLL1	54.800[*]	6.665	.000	35.48	74.12
	nonCALLL2	39.000[*]	6.665	.000	19.68	58.32
	nonCALLMC	30.350[*]	6.665	.000	11.03	49.67
	CALLL1	29.500[*]	6.665	.000	10.18	48.82
	CALLL2	15.000	6.665	.223	-4.32	34.32

The descriptive results of the second posttest are illustrated in the table below. The mean scores of all groups decreased in the second VKS. The results indicate that CALL groups have higher mean scores compared with NONCALL groups.

Table 6. Descriptive Statistics for the Second VKS.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
noncallL1	20	87.75	27.137	6.068	75.05	100.45
noncallL2	20	91.60	19.653	4.395	82.40	100.80
NoncallMC	20	112.15	20.864	4.665	102.39	121.91
callL1	20	108.30	16.639	3.721	100.51	116.09
callL2	20	121.45	22.296	4.985	111.02	131.88
CallMC	20	130.95	16.172	3.616	123.38	138.52
Total	120	108.70	25.486	2.327	104.09	113.31

In the retention phase, CALL MC group outperformed all other NONCALL groups significantly, but no significant differences were found to be between CALL MC and CALL L2.

Provision of English glosses (L2 glosses) involves learners mind more than Farsi glosses (L1 gloss) and as a result in the posttest phase students remember words better than L1 groups. No significant differences were found to be between Non CALL multiple choice group with CALL groups in the retention phase.

Table 7.The Results of Second VKS One Way ANOVA

ANOVA					
test2					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28020.000	5	5604.000	12.965	.000
Within Groups	49275.200	114	432.239		
Total	77295.200	119			

Table 8. Post hoc Tuckey for Second VKS.

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
nonCALLL1	nonCALLL2	-3.850	6.574	.992	-22.91	15.21
	nonCALLMC	-24.400[*]	6.574	.004	-43.46	-5.34
	CALL L1	-20.550[*]	6.574	.027	-39.61	-1.49
	CALLL2	-33.700[*]	6.574	.000	-52.76	-14.64
	CALLMC	-43.200[*]	6.574	.000	-62.26	-24.14
nonCALL2	nonCALLL1	3.850	6.574	.992	-15.21	22.91
	nonCALLlMC	-20.550[*]	6.574	.027	-39.61	-1.49
	CALLL1	-16.700	6.574	.121	-35.76	2.36
	CALL L2	-29.850[*]	6.574	.000	-48.91	-10.79
	CALLlMC	-39.350[*]	6.574	.000	-58.41	-20.29
nonCALLMC	nonCALLL1	24.400[*]	6.574	.004	5.34	43.46
	nonCALLL2	20.550[*]	6.574	.027	1.49	39.61
	CALLL1	3.850	6.574	.992	-15.21	22.91
	CALLL2	-9.300	6.574	.718	-28.36	9.76
	CALL MC	-18.800	6.574	.055	-37.86	.26
CALLL1	Non CALL L1	20.550[*]	6.574	.027	1.49	39.61
	nonCALLL2	16.700	6.574	.121	-2.36	35.76
	nonCALLMC	-3.850	6.574	.992	-22.91	15.21
	callL2	-13.150	6.574	.349	-32.21	5.91
	CALLMC	-22.650[*]	6.574	.010	-41.71	-3.59
CALLL2	nonCALlL1	33.700[*]	6.574	.000	14.64	52.76
	nonCALLL2	29.850[*]	6.574	.000	10.79	48.91
	nonCALLMC	9.300	6.574	.718	-9.76	28.36
	CALLL1	13.150	6.574	.349	-5.91	32.21
	CALLMC	-9.500	6.574	.700	-28.56	9.56
CALLMC	nonCALLL1	43.200[*]	6.574	.000	24.14	62.26
	nonCALLL2	39.350[*]	6.574	.000	20.29	58.41
	nonCALLMC	18.800	6.574	.055	-.26	37.86
	CALLL1	22.650[*]	6.574	.010	3.59	41.71
	CALL L2	9.500	6.574	.700	-9.56	28.56

Conclusion

This study investigated the effectiveness of three different types of glosses namely, L1, L2, and multiple choice in two different traditional and computerized settings. The findings of the study are in tune with Laufer and Hulstijn's Involvement Load Hypothesis (2001) in which the main belief is that if learners search for the meaning themselves, they will be more involved in the process of learning and as a result, learning will be boosted. The results were also in tune with (Farvardin & Biria, 2012; Hulstijn, 2001; Nagata 1999; Srichamnong, 2009) in that students in multiple

choice groups outperformed the other groups significantly. The students in CALL Multiple choice group outperformed NON CALL multiple choice group since they were provided with feedback which decreases the amount of wrong guesses and facilitate vocabulary learning more. The results also indicate that computerized version of glosses has more significant effect on students vocabulary learning.

References

Davis, J. N., & Lyman-Hager, M. A. (1997). Computers and L2 Reading: Student Performance, Student Attitudes. *Foreign Language Annals*, *30*(1), 58-72.

DeCarrico, J. S. (2001). Vocabulary learning and teaching. In M. Celce-Murcia (Ed.), *teaching English as a second or foreign language* (3rd ed.) (pp. 285-299). Us: Heinel & Heinle.

Edwards, L. (2009). *Solutions placement test*. Oxford: Oxford University Press.

Farvardin, M. T., & Biria, R. (2011). Textual glosses, text types, and reading comprehension. *Theory and Practice in Language Studies*, *1*(10), 1404-1415.

Hsu, M. H. (2011). The Effect of First Language Gloss on Reading Comprehension, Lexical Acquisition and Retention: Single Gloss and Multiple-Choice Gloss *WHAMPOA - An Interdisciplinary Journal, 61 期*, 33-52.

Hulstijn, J. H. (1992). Retention of inferred and given word meanings: Experiments in incidental vocabulary learning. In: P.J.L Arnaud & H. Bejoint (Eds.), *Vocabulary and applied linguistics*, London: Macmillan, 113-125. International Reading Association.

Hulstijn, J. H., Hollander, M., & Greidanus, T. (1996). Incidental vocabulary learning by advanced foreign language students: The influence of marginal glosses, dictionary use, and reoccurrence of unknown words. *The Modern Language Journal*, *80*(3), 327-339.

Hulstijn, J.H. & Laufer, B. (2001). Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. *Language Learning*, *51*, 539–58.

Jacobs, G. M., Dufon, P., & Hong, F. C. (1994). L1 and L2 vocabulary glosses in L2 reading passages: Their effectiveness for increasing comprehension and vocabulary knowledge. *Journal of Research in Reading*, *17*(1), 19-28.

Ko, M. H. (2012). Glossing and second language vocabulary learning. *Tesol Quarterly*, *46*(1), 56-79.

Laufer, B. (1992). They Think They Know Them, but They Don't. *English: A World Language*, *2*(1), 79-85.

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied linguistics*, *22*(1), 1-26.

Miasako, N. (2002). Does text-glossing have any effects on incidental vocabulary learning through reading for Japanese senior high school students?. *Language Education & Technology*, (39), 1-20.

Nagata, N. (1999). The Effectiveness of Computer-Assisted Interactive Glosses. *Foreign Language Annals*, *32*(4), 469-479.

Nation, I.S.P., (2001). Learning Vocabulary in Another Language. Cambridge: Cambridge University Press.

Paribakht, T. S., & Wesche, M. (1997). Vocabulary enhancement activities and reading for meaning in second language vocabulary acquisition. *Second language vocabulary acquisition: A rationale for pedagogy*, 174-200.

Read, J., (2000). Assessing Vocabulary. Cambridge University Press, Cambridge, UK.

Rott, S., Williams, J., & Cameron, R. (2002). The effect of multiple-choice L1 glosses and input-output cycles on lexical acquisition and retention. *Language Teaching Research*, *6*(3), pp. 183-222.

Schmidt, R. W. (1990). The role of consciousness in second language learning. *Applied linguistics*, *11*(2), 129-158.

Srichamnong, N. (2009). Incidental EFL Vocabulary Learning: The effects of interactive multiple-choice glosses. *ICT for Language Learning, Florence, Italy*.

Stahl, S. (1983). Differential word knowledge and reading comprehension. *Journal of Literacy Research*, *15*(4), 33-50.

Tabatabaei, O., & Shams, N. (2011). The effect of multimedia glosses on online computerized L2 text comprehension and vocabulary learning of Iranian EFL learners. *Journal of Language Teaching and Research*, *2*(3), 714-725.

Wang, W. T. (2005). *The effects of vocabulary glosses on EFL vocabulary learning* (Doctoral dissertation, Ming Chuan University).

Watanabe, Y. (1997). Input, intake, and retention. Effects of increased processing on incidental learning of foreign language vocabulary. *Studies in second language acquisition*, *19*(3), 287-307.

Webb, S. (2008). The effects of context on incidental vocabulary learning. *Reading in a Foreign Language*, *20*(2), 232-245.

Webb, S., Newton, J., & Chang, A. (2013). Incidental learning of collocation. *Language Learning*, *63*(1), 91-120.

Yoshii, M. (2006). L1 and L2 glosses: Their effects on incidental vocabulary learning. *Language Learning & Technology*, *10*(3), 85-101.

Yoshii, M. (2013). Effects of gloss types on vocabulary learning through reading: Comparison of single and multiple gloss types. *CALICO Journal*, *30*, 203-229.

Yoshii, M., & Flaitz, J. (2002). Second language incidental vocabulary retention: The effect of text and picture annotation types. *CALICO journal*, *20*(1), 33-58.

Zarei, A. A., & Gilanian, M. (2013). The effect of multimedia modes on L2 vocabulary learning. *International Journal of Management and Humanity Sciences*, *2*, 1011-1020.

Zarei, A. A., & Mahmoodzadeh, P. (2014). The Effect of multimedia glosses on L2 reading comprehension and vocabulary production. *Journal of English Language and Literature*, *1*(1), 01-07.

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