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Iranian Journal of Language Teaching Research

ORIGINAL ARTICLE

Urmia University

It is all "English" to me: Can Cross-Culture Overlaps Facilitate L2 Idioms Teaching?

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ABSTRACT

Idioms are highly conventionalized expressions that allow users to express beyond literal meanings. Despite the language difference, counterparts of idioms may overlap cross-culturally due to similar origin, social habits, and experiences. It is therefore interesting to probe whether L2 learners may benefit from deliberate instructions built on shared counterparts existing in both L1 and L2, known as cross-language overlaps. Although the phenomenon of cross-language overlap has been reported by lexical and collocation processing research (e.g., Carrol & Conklin, 2017; Hubers et al., 2020), it is yet uncertain whether its impact is influential for L2 idiom learning with the absence of semantic or syntactical similarity. To address this gap, the current study attempted to investigate whether raising English as a foreign language learners' awareness of cross-language overlap may facilitate L2 idiom teaching and how such overlap-enhancement instruction may change over different congruence conditions (congruence-available and incongruence conditions) and time. The study collected L2 idiom learning data from forty-five Chinese English learners, following a pretest-posttest design. While the experimental group (n=26) learned twenty-eight target L2 idioms with an enhancement instruction emphasizing the overlaps, the control group (n=28) learned these idioms with a conventional instruction method. Findings of this study revealed that participants were able to benefit from cross-language overlaps from both conditions, and the enhancement instruction on the semantic overlaps would result in significant learning improvement. It is therefore pedagogically advisable for language teachers to marry up L1-L2 idiom phrases containing similar counterparts and deliberately focus on the semantic congruency.

Keywords: cross-language overlaps enhancement; L2 idiom teaching; idiom congruence; English as foreign language classrooms; L2 figurativeness

ARTICLE HISTORY

Received: 15 Oct. 2023 **Revised version received:** 20 May 2024

Accepted: 18 June 2024 **Available online:** 10 July 2024

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doi 10.30466/ijltr.2024.54945.2609

Introduction

As a major component of second language (L2) learning, the importance of lexical building has been addressed numerous times in L2 vocabulary and pedagogy research (Brown et al., 2022; Folse, 2011; Zareva et al., 2005). The development of lexical competence, meanwhile, is complex because it requires L2 learner's capability of both memorizing and manipulating a large number of L2 lexical items (Eguchi et. al., 2022). Given that idioms are arbitrary combinations of individual words, learning L2 idioms can be overwhelming. Beyond the conventional vocabulary-building demands, there is always a figurativeness issue to tackle and a culture gap to mind between the L1 and L2 contexts. As a consequence, instructors in L2 idiom teaching scenarios are often struggling between tossing bundles of new words at the students and snowing them under with a substantial amount of metaphor interpretations.

Teaching L2 idioms incorporates myriad subordinate learning objectives. Cognitive research (Cucchiarini et al., 2022; Senaldi & Titone, 2022; Soto-Sierra & Ferreira, 2024) has attributed the process of L2 idiom learning to the development of L2 learners' idiom intuitions. Different intuitions such as the extent to which an L2 idiom is familiar, structurally interpretable, and literally plausible to L2 learners, are identified as significant factors that may contribute to L2 idiom processing. Similarly, second language acquisition (SLA) research also views L2 idiom learning multifariously. L2 learners' mastery over L2 idioms concerns students' abilities to accurately memorize, understand, and address L2 idioms in proper context (Li & Liontas, 2023; Mirzaei et al., 2023; Obermeier & Elgort, 2021). Irrespective of the theoretical variance, a general consensus of different tracks of research is that L2 idioms are challenging to teach because their figurative meanings are often opaque to L2 learners, while the semantic meanings of these constituent words contribute little to the overall idiomatic meaning. Although there has been an increasing number of pedagogical suggestions regarding how idioms should be effectively delivered in L2 classrooms, a vast amount of these techniques was form-focused and explicit-teaching oriented, with the instruction of L2 idiomatic mechanisms often neglected.

As a culturally conventionalized feature found in cross language contexts, the presence of cross language overlaps (CLOs), the shared counterparts existing in both L1 and L2 words or expressions, may provide an alternative mediation for teaching L2 figurativeness. Built on pedagogical experimentation, earlier L2 researchers (e.g., Liontas, 2015) suggested that L2 learners were likely to benefit from familiar L1 knowledge during L2 learning. This idea was consistent with the congruency effect reported in collocation research where L2 speakers showed advantage when processing L1-L2 congruency collocations (Carrol & Conklin, 2017). Similarly, evidence from recent L2 lexical processing research suggested that L2 bilinguals tended to adopt a "direct-retrieval-fashion" in which meanings were directly stored and retrieved with the presence of L1-L2 congruence (Senaldi & Titone, 2022; Titone et al., 2015). Such a facilitatory effect, however, is not always applicable for L2 idiom processing because there has been evidence suggesting that the shared counterparts between L1-L2 might not contribute to faster L2 idiom processing (Beck & Weber, 2021; Dang et al., 2022) and may even lead to confusion (Cieślicka & Heredia, 2011). Besides, while the effects of lexical and syntactical congruency were examined in an increasing body of research (Carrol & Conklin, 2017; Hubers et al., 2020), it remained unclear whether similar impacts could be found for L1-L2 congruency at a conceptual level. To help address these gaps, the current study investigated whether the involvement of CLOs and raising L2 learners' awareness of CLOs would be beneficial for L2 idiom teaching.

Notably, "idiom" is a term frequently defined by a variety of criteria. For example, idioms have been described as conventionalized expressions conveying fixed meanings by lexical processing research for their semantics and figurativeness related entities, while collocation research has defined them as a subcategory of multiunit words (Beck & Weber, 2021; Carrol et al., 2016; Chen, 2024; Cucchiarini et al., 2022; Liontas, 2003). To better concentrate on the L1-L2 overlaps rather

than being constrained by their forms, all types of highly conventionalized figurative expressions commonly seen in language teaching settings were considered idioms.

Literature Background

Teaching L2 Figurativeness and L2 Idioms

Since idioms are often defined as a subcategory of multiword sequences (Du et al., 2021; Öksüz et al., 2021), the impact of lexical development techniques is an important aspect examined by a wealth of pedagogical research regarding L2 idioms. Rooted in input enhancement approaches, the potential of textual enhancement has been explored by a particular line of L2 idiom teaching research (Jung et al., 2022; Puimège et al., 2023; Shabani & Rahimy, 2020). Researchers have reached a general consensus that L2 learners are likely to benefit from enhancement in terms of L2 idiom recognition and memorization. Puimège et al. (2023), for example, reported some processing advantages for captioned audiovisual input. Based on the comparison of two groups' eye-tracking data, they suggested that the enhanced idioms received greater visual attention than the unenhanced idioms, and may therefore facilitate better idiom recalling. Zuo (2021) further suggested that the enhancement remained effective even when attention has been paid to constituents of an L2 idiom. According to a series of comparisons built on different task conditions and task types, the author explained that the enhancements were useful for offering compensation for L2 learners' ignorance about the unfamiliar forms of the novice collocations.

In addition to individual words, lexical enhanced instructions are also found applicable for L2 phrasal learning. With a pretest-posttest study evidenced by sixty Iranian EFL learners' phrase development data, Mirzaei et al. (2023) revealed that both intentional and incidental focus on lexis (FonL) instruction groups were found more productive than the control group, while instructional techniques such as pause, voice raising, and tone changing were found useful for improving L2 learners' phraseology knowledge. Despite its effect on constituent words and collocations, it is relatively unknown whether such an enhancement effect would persist at a conceptual level. However, the idea of interpreting conceptual meanings for L2 has been addressed in some pedagogical research and books (Karatay et al., 2022; Piquer-Píriz & Alejo-González, 2020). In view of metaphor being the result of concrete source-domains mapping onto abstract target-domains (Lakoff & Johnson, 1980), L2 learners are believed capable of disclosing the idiomatic meanings encrypted in constituent words of an idiom if knowledge of semantic-metaphor mapping relationships is instructed. In line with this idea, Karatay et al. (2022) conducted an action research project based on forty-five L2 Turkish learners' performance of learning orientation idioms. By comparing the mean scores before and after the semantic-metaphor mapping instruction, Karatay and colleagues (2022) suggested that participants had developed their idiom retention and prediction abilities.

Additionally, learners' capacity of employing idiom phases in an L2 context is another perspective valued by many researchers (Li & Liontas, 2023; Werkmann Horvat et al., 2021). In light of the finding that successful L2 output may eventually motivate L2 learners to move beyond mimic and memorization, pedagogy researchers have yielded a variety of production-oriented approaches to ensure sufficient opportunities for students to apply L2 idioms in authentic L2 contexts, ranging from role-play description activities guided by illocutionary cues (e.g., assertion, promise, inquire) that convey distinct messages in speeches (Cucchiarini et al., 2022; Liontas, 2015; Liontas, 2017) to task-based curriculum designs directed through pre-task to post-task diagrams (Upadhaya & Sudharshana, 2021). Since meanings of collocations are usually expressed in completed clauses, the role contextual information plays during idiom processing has also been frequently examined (Milburn et al., 2021; Obermeier & Elgort, 2021). Idiom processing research suggested that

knowing contextual information is important for speakers to form a mechanism that retrieves the prominent meaning among multiple plausible interpretations of idiomatic expressions (Senaldi & Titone, 2024). This idea was supported indirectly through evidence from recent normative studies (Hubers et al., 2020) indicating that L2 learners' intuition of how L2 idiomatic expressions were used in L2 context was a significant contributor of L2 learners' comprehension of idioms.

Congruency Effect and Impact of Cross Language Overlap

Second Language Acquisition **(**SLA) research has a long history of considering L2 learners' prior L1 knowledge as an important source of L2 learning. As an extension of this idea, researchers further conducted a series of studies examining the role L1 knowledge played in L2 idiom learning (Li & Liontas, 2023; Liontas, 2003). Given that there were different overlapping circumstances, CLO was further categorized as Lexical Level (LL) idioms, those sharing both word-to-word lexical overlaps, Post-Lexical Level (PLL) idioms, those sharing no lexical counterparts, and Semi-Lexical Level (SLL) equivalent idioms that partially shared word-to-word lexical overlaps.

In addition to Liontas' taxonomy, the impacts of CLOs were also extensively discussed in collocation research as the congruency effect, described as the faster and more accurate retrieval of congruent collocations. As an important component of L2 collocations, CLOs in idioms were usually classified as congruent collocations containing word-for-word L2 equivalence, and incongruent collocations, those without word-for-word equivalence (Chen, 2024; Steinel et al., 2007; Yamashita, 2018). Taking such congruent and incongruent categorization a step further, L2 lexical processing research cautiously defined the degree of CLOs by their lexically and semantically overlapping conditions. From semantically inequivalent L1-L2 idioms to word-to-word semantically equivalent L1-L2 idioms, Titone and colleagues (2015) adopted a five-level CLO taxonomy, to describe different L1-L2 equivalent idioms sharing similar lexical counterparts. Such a taxonomy has been widely adopted by idiom norm studies despite slight variations (Hubers et al., 2020).

Despite the emerging findings that account for the impacts of CLOs during L2 processing, evidence is mixed as to whether CLOs were beneficial for L2 learners. For example, Carrol et al. (2016) suggested that L1-L2 cognates may lead to a facilitatory effect for L2 idiom processing. In a priming experiment where Swedish English learners were required to process L1-translated English idioms, congruent idioms, and English idioms, Carrol and colleagues found that the Swedish participants showed consistent advantages in terms of processing all idioms other than controlled phrases and explained this as evidence of an automatic L1 triggering. However, evidence from a subsequent study revealed an alternative impact of CLOs. With an eye-tracking experiment designed with idioms of different transparency conditions, Cieślicka and Heredia (2017) reported that Spanish-English bilinguals spent more time processing L1-L2 overlapped idioms than novel L2 idioms in reading comprehension. They explained this phenomenon as participants' obviation behavior of suppressing the "unwanted alternative."

Additionally, there has been some inconsistency with regard to what and how CLOs may impact L2 idiom processing. In two eye-tracking experiments where reading times of idiom processing and interpretation times of literal and figurative usages were inspected, Carrol and Conklin (2017) found that Chinese English learners showed recognition of the translated L1 forms but showed hesitations understanding their figurative meanings. Meanwhile, according to two cross-model priming experiments that compared German English learners and native English speakers' response between lexical and post-lexical equivalent L2 idioms, Beck and Weber (2016) indicated that the presence of lexical equivalence neither facilitates nor prohibits meaning activation for L2 learners.

While the majority of lexical processing research has investigated CLOs on L1-L2 alphabetic bias, the impact of logographic-alphabetic CLOs has rarely been explored (Carrol & Conklin, 2014, 2017). Moreover, the existing logographic-alphabetic CLO research was mainly built on translated L1 idioms, which cannot be directly generated for pedagogical applications. In fact, the phenomena of CLOs also exist among logographic-alphabetic idiom pairs, although most of the congruent idiom pairs were semantically equivalent because word-to-word equivalence seldom applied to logographic-alphabetic collocations. For example, a congruent form of the English idiom "kill two birds with one stone" is "yi shi er niao" (one stone two birds), complying with a four-word-symmetry collocational rule. In such a collocation type, semantic meanings of "yi shi" (one stone) symmetrically matches "er ciao" (two birds) and the entire verb-phrase structure was compressed to fulfill the numeric requirement. To address the congruent conditions among logographic-alphabetic idiom pairs, the current study adopted the term "congruency-available idioms" to describe L1-L2 CLOs containing shared lexical counterparts and "incongruent idioms" defining L1-L2 CLOs that only overlap at the overall semantics level.

Despite a plethora of lexical processing research examining the role CLOs play in L2 idiom processing, pedagogical research lags, and is heavily built on form-focus techniques and communicative language teaching activities where L2 lexical and L2 figurativeness teaching were not well balanced, whereas the widely observed CLOs offer L2 teachers an alternative mediation for idiom teaching. There are, nevertheless, many questions that remain unexplored before applying CLOs in the L2 classroom. First, since the majority of the CLO research (Hubers et al., 2020; Titone et al., 2015) was built on alphabetic L1-L2 where word-to-word congruence was common, and the degree of the CLO was measurable through the amount of cognates, it is relatively unclear whether semantic CLOs existing between logographic-alphabetic languages may result in a similar impact for idiom processing. Also, while previous research revealed that semantic CLOs (Titone et al, 2015) and syntactical CLOs (Carrol & Conklin, 2017) play a facilitatory role during L2 idiom processing, it is unknown whether CLOs remain influential at a conceptual level. In addition, given that both constituent-focused lexical enhancement (Zuo, 2021) and deliberate conceptual metaphor instruction (Karatay et al., 2022) were found beneficial for L2 idiom learning, it is therefore worthy to probe whether enchantment built on CLOs may also have an impact on idiom teaching.

To investigate these issues, the current study conducted a pretest-posttest experiment to inspect whether raising L2 learners' awareness of CLOs caused a facilitatory effect for L2 idiom learning. Also, a delayed posttest was designed to measure the effectiveness of CLOs enhancement instruction over time.

Research Questions

In brief, the following research questions guided this study:

Q1: Does the presence of congruence-available cross language overlap affect L2 idiom learning?

Q2: Does the presence of incongruence cross language overlap affect L2 idiom learning?

Q3: Does deliberate instruction focusing on the congruence-available and incongruence cross language overlap features affect L2 idiom learning?

Method

Participants

Participants were three intact English Research Writing (ERW) cohorts of sophomore students from a dual-degree program containing both Chinese and English medium courses. The ERW course was designed to help students develop their academic writing skills in a second language context. Students had to meet an IELTS score of 5.5 (academic) or equivalent before being admitted to the dual-degree program. The course took place twice a week, each for 90 minutes. Students had limited exposure to English idiomatic expressions. None of the other materials in the ERW syllabus were related to English idioms. Normative information (e.g., intuition in idiom familiarity) was obtained from a random cohort (n=31, average age=20, *SD*=0.929), while the other two intact cohorts were randomly assigned to either an experimental group (n=26, average age=20, SD=1.230) or a control group (n=28, average age=20, *SD*=0.685).

Materials

The experimental materials consisted of twenty-eight English idioms, selected through specific criteria. First, high-frequency L1 idioms were selected based on the Centre for Chinese Linguistics (CCL) corpus and paired with their L2 equivalent idioms obtained from Collins *English Dictionary* (8th Edition), *Oxford English Dictionary* (7th Edition), and *McGraw-Hill's Dictionary of American Idioms and Phrasal Verbs* (1st Edition). Subsequently, higher L2 frequency and transparency idioms were discarded to better serve the instructional needs of the design. Normative data (i.e., L2 frequency and L2 transparency) were obtained from thirty-one students from the same dual-degree program, using a five-point-scaled idiom-norm-collection questionnaire (Hubers et al., 2020). Reliabilities of students' rates (α>0.9 for both properties) were measured by the "ltm" package (Rizopoulos, 2006) of R. Consequently, twenty-eight idiom pairs were selected as stimuli materials. (Normative data are available at https://doi.org/10.6084/m9.figshare.24265108.)

Table 1
A Brief Introduction of the Chinese-English Idiom Congruency Conditions

No	Chinese Idiom Phrase	English Idiom Phrase	CLO Condition
1	yī shí èr niǎo 一石二鸟	kill two birds with one stone	congruence-available
5	bì zhǒu qiān jīn 敝帚千金	all one's geese are swans	incongruence

The congruent counter-parts have been underlined.

The twenty-eight idiom pairs were further categorized by their congruence conditions, including fourteen congruence-available and fourteen incongruent idioms. In this category, L1-L2 idioms containing congruent semantic counterparts were defined as congruence-available CLOs, regardless of their lexical and syntactic conditions. Meanwhile, L1-L2 idioms that contain no congruent semantic counterparts but share identical conceptual meanings were defined as incongruent CLOs. A brief introduction of the categorization criteria has been introduced in Table 1, and a full list of the pairs can be found in Appendix I.

To note, rigid word-to-word congruence is unconventional for Chinese-English CLOs. This can be seen from a comparison between Chinese "yi shi er niao" and English "kill two birds with one stone," in which constituent words of the two phrases are unevenly matched. Similarly, the phenomenon of collocation congruency is rare in the real-life L1-L2 language contexts. Taking the "kill two birds with one stone" case as an example, the pattern "to kill ..with…" disappears in the Chinese "yi shi er niao" for being redundant to the syntactical structure.

The Enhanced Instruction and the Lexical Instruction

To better raise participants' awareness on the CLOs, the current study employed a retroactive pair-associate learning (PAL) paradigm where target L2 idioms were paired to their L1 equivalents. For each item, participants of the experimental group were given an L2 idiom and its paired L1, and made aware of the semantical overlaps between the pairs by the PAL. Subsequently, vocabulary knowledge of the constituent words was introduced to the students, and the overall meaning of the target L2 idiom was explained. As for the control group, the meanings of the target expression and its constituent words were given in a fashion similar to the experimental group, although the CLOs were not explicitly instructed to the participants. To minimize the interaction effects caused by different learning tasks and objectives, each item was taught retroactively in the direct-teaching fashion with the same instructor (Dang et al., 2022; Tormo et al., 2022; Zuo, 2021).

Design and Procedure

The current study followed a pretest-immediate posttest-delayed posttest design. A week before the activity, a pretest was given to both the control and experimental groups to collect base-line knowledge. Participants were asked to complete an online idiom comprehension test based on multiple-choice questions. They were given brief instruction regarding the purpose of the test. In terms of the posttests, participants were given an immediate posttest after the instruction and a delayed posttest two weeks after the instruction. All tests used the same format and used both congruence-available and incongruent idioms as test items, while these items were given in different orders to avoid the testing effect. Twenty-six participants from the control group and twenty-eight participants from the experimental group submitted their responses in all tests. For further analysis, the congruence-available and incongruent idioms were scored separately. Each correct answer was assigned "1" point and incorrect answers were assigned "0." The maximum score for both tests was "14."

Analysis

In the preliminary test, two pair-wised comparisons (i.e., the congruence-available condition and the incongruence condition) were conducted to examine participants' performance in pretests, with no significant difference found between the control and experimental groups ($p>.05$ in both conditions). Also, normality was confirmed by the D'Agostino skewness test of normality ($p>.05$ in all cases), using the "moments" package of R (Komsta & Novomestky, 2022). To examine and compare the effects of CLOs-enhanced idiom instruction in congruence-available and incongruence conditions, two linear-mixed-effects-regression (LMER) models were performed, using the "lmerTest" package of R (Kuznetsova et al., 2017). The statistical analysis methods used in traditional pretest-posttest designs (e.g., *t*-test or ANOVA) are every so often questioned for their incapability of dealing with data independence. However, mixed-effects models can not only simultaneously perceive the contributions of the treatment (i.e. the instruction) and attain the pretest-posttest comparisons by involving them as fixed effects, but they also take into account the potential variance ascribed to individual differences by the inclusion of random effects (Jost & Jansen, 2022; Yue et al., 2022) As for the current study, scores for congruence-available and

incongruent idiom comprehension were respectively considered as the independent variables for each model, while Group (control x experimental), Time (pre, immediate post and delayed post) and the interaction between Group and Time were considered as fixed effects, with "Participants " seen as a random effect. Scores of the control group and the immediate posttest were the reference level. Multicollinearity of both models were checked by the "performance package" of R (Lüdecke et al., 2021). The variance information scores (VIF) for Group and Time in both models were lower than 5.0, suggesting no problems with multicollinearity.

Results

Table 2 presents the mean scores of each group for congruence-available and incongruent idiom pairs learning. Overall, the mean scores increased from the pretest to the immediate posttest and delayed posttest for all cases but changed differently from the immediate posttest to the delayed posttest, in different tasks.

Table 2
Mean Scores, SDs on the Pretest, Immediate Posttest, and Delayed Posttest

	Congruence-Available Idioms			Incongruent Idioms		
Group	Pretest	Immediate Posttest	Delayed Posttest	Pretest	Immediate Posttest	Delayed Posttest
Control	8.42 (2.16)	11.51 (2.52)	10.81 (2.83)	6.96 (2.99)	7.23 (2.45)	7.00 (2.19)
Experiment	8.46 (2.46)	11.93 (1.98)	11.31 (1.93)	6.71 (1.98)	9.46 (2.33)	9.5 (2.63)

Analysis of the incongruence model revealed that the entire model explained 77.3% of the variance (Conditional R^2 = 0.773) and the fixed effect explained 28.3% of the variance (Conditional R^2 = 0.283) in the score. As presented in Table 3, there was a significant main effect for Time (Pre) (b=-2.6923, t=-7.775, p<0.001), suggesting that the overall immediate posttest mean scores for both groups were higher than their performance in the pretest. However, no significant main effect was found for Time (Delayed), suggesting no changes of scores between the delayed posttest and the immediate posttest. Also, no significant interaction was found between the instruction and the time, suggesting that the treatment did not cause a significant difference.

Table 3
Learning Gains over Different Testing Times for Incongruent Idiom Pairs

	b	*SE*	*95%CI*	*df*	*t*	*p*
Intercept	11.1154	0.4351	[10.27, 11.96]	80.6608	25.545	2e-16 ***
Instruction (Stimuli)	0.8132	0.6043	[-0.36, 1.99]	80.6608	1.346	0.182
Time(Delayed)	-0.3077	0.3463	[-0.98, 0.36]	104.0000	-0.889	0.376
Time (Pre)	-2.6923	0.3463	[-3.36, -2.02]	104.0000	-7.775	5.68e-12 ***
Instruction (Stimuli) x Time(Delayed)	-0.2995	0.4809	[-1.23, 0.63]	104.0000	-0.623	0.535
Instruction (Stimuli) x Time (Pre)	-0.7720	0.4809	[-1.71, -0.16]	104.0000	-1.605	0.111

***p < .001 (two-tailed). The categories provided in parentheses are compared to the reference categories.

To further understand whether the treatment may result in different learning gains in the incongruence scenario, pairwise comparisons were performed, using the "emmeans" package (Lenth, 2023). As for the pretests, there was no significant difference found between the control and treatment groups (t=-0.068, p=0.945, d=-0.033), suggesting that participants were at a similar level in terms of L2 idiom recognition. Also, between the control and treatment groups, no significant difference was found for the immediate posttest (t=-1.346, p=0.182, d=-0.651) or the delayed posttest (t=-0.850, p=0.397, d=-0.411), suggesting that the treatment did not differentiate the score of participants. Meanwhile, improvements of L2 idiom learning were obtained from both groups. Regarding the treatment group (i.e. the instruction group), significant differences were found between the immediate posttest and the pretest (t=10.382, p<0.001, d=2.775) and between the delayed posttest and the pretest (t=8.563, p<0.001, d=2.289), whereas no significant difference was found between the immediate and delayed posttests (t=1.820, p=0.168, d=0.486). A similar pattern of learning gains was also seen in the control group, where a significant difference was found between immediate the posttest and the pretest (t=7.775, p<0.001, d=2.156) and between the posttest and the pretest (t=6.887, p<0.001, d=1.910), but not between the immediate and delayed posttests (t=0.889, p=0.648, d=0.246). These results suggested that the availability of the conceptual CLO alone may contribute to a facilitatory effect for L2 idiom learning, and participants were capable of retaining the L2 idiomatic knowledge for a given period after the idiom instruction.

Analysis of the congruence model revealed that the entire model explained 59.4% of the variance (Conditional R^2 = 0.594) and the fixed effect explained 19.6% of the variance (Conditional R^2 = 0.196) in the score. As presented in Table 4, a significant main effect (*b=2.3158, t=3.434, p<0.001*) was found for Group (Stimuli), suggesting that the overall mean scores of the treatment group were much higher than the control group. Besides, a significant interaction was only found for the treatment (i.e., the CLOs enhanced instruction) group by Time in the case of pretest (*b=-2.5448, t=-3.775, p<0.001*), which indicated significant change of scores between the pretest and the immediate posttest.

Table 4
Learning Gains over Different Testing Times for Congruence-Available Idiom Pairs

	b	*SE*	*95%CI*	*df*	*t*	*p*
Intercept	7.2308	0.4829	[6.29, 8.17]	104.0381	14.972	2e-16 ***
Group (Stimuli)	2.3158	0.6744	[1.01, 3.63]	105.4192	3.434	0.000852 ***
Time (Delayed)	-0.2308	0.4832	[-1.17, 0.71]	103.9710	-0.478	0.633966
Time (Pre)	-0.2692	0.4832	[-1.21, 0.67]	103.9710	-0.557	0.578621
Group (Stimuli) x Time (Delayed)	0.1842	0.6748	[-1.12, 1.50]	104.1296	0.273	0.785410
Group (Stimuli) x Time (Pre)	-2.5448	0.6741	[-3.85, -1.23]	104.5644	-3.775	0.000266 ***

***p < .001 (two-tailed). The categories provided in parentheses are compared to the reference categories.

To further understand the difference, pairwise comparisons were performed, using the "emmeans" package (Lenth, 2023). Pairwise comparisons between the control and treatment groups revealed no significant difference in the pretest (t=0.267, p=0.789, d=0.102), suggesting that participants were at a similar level in terms of L2 idiom recognition. Meanwhile, significant differences were found in the immediate posttest (t=-3.369, p=0.001, d=-1.282) and the delayed posttest (t=-3.803, p=0.002, d=-1.447), suggesting that the treatment caused a better performance.

Within the treatment group, significant differences were found between the pretest and the immediate posttest (t=5.948, p<0.0001, d=1.610) and between the pretest and the delay-posttest (t=6.026, p<0.0001, d=1.589). Meanwhile no significant difference (t=-0.077, p<0.996, d=-0.020) was found between the immediate test and the delayed posttest. As for the control group, no significant difference was found for all cases. These results further supported the conclusion that raising participants' attention to the CLO counterpart between L1 and L2 idioms may facilitate L2 idiom learning.

Discussion

The current study extended previous research (Carrol & Conklin, 2017; Hubers et al., 2020) in several ways. First, this study is among the few studies that investigated L2 idiom learning in logographic-alphabetic CLO scenarios. Given that similar research was built on L1 and translated L2 collocations, the current study was a preliminary study that explored effects of CLOs in natural L1-L2 contexts. Also, it is the first pedagogical study investigating how CLOs can be used as a mediation for L2 classrooms.

The Effect of Enhancement for Conceptual Cross-Language Overlaps

In terms of learning incongruent L1-L2 CLO idioms, the current study found an increase of 6.96 to 7.23 words for the control group, and an increase of 6.71 to 9.46 words for the experimental group. Such significant learning gains are in line with some lexical processing (e.g., Titone et al., 2015) and psycholinguistic evidence (e.g., Hubers et al., 2020) suggesting that CLOs may result in a facilitatory effect during L2 idiom processing. In particular, these results further suggested that L2 learners may benefit from the CLOs, even with the absence of semantic and syntactical congruency.

Consistent with some lexical processing (e.g., Titone et al., 2015) and psycholinguistic evidence (e.g., Hubers et al., 2020), the current study found evidence of CLO facilitation during L2 idiom processing. In particular, the current study found significant L2 idiom learning improvement for incongruent CLOs, regardless of the instruction types. Such a result provided some preliminary evidence that CLOs may have impacts on L2 idiomatic comprehension, even with the absence of semantic and syntactical congruency. Although little research has yet directly dealt with whether congruency at a conceptual level may contribute to L2 idiom learning, evidence from pedagogy research (Karatay et al., 2022; Upadhaya & Sudharshana, 2021) suggested that deliberate instructions concentrating on the conceptual meanings could lead to a better performance in learning L2 idioms. Given that the conceptual CLOs prepared L2 learners with fundamental knowledge for interpreting L2 figurativeness of similar expressions, it is therefore arguable that the increase observed from the current study was a result of the figurativeness preparation.

Meanwhile, the current study found there were no significant differences in the learning gains for the two groups, even though the increase for the experimental group was numerically higher than the control group. This result suggested that facilitatory effects were not attributed only to the CLO enhancement but also some vocabulary-building instruction given to both groups. A possible explanation of this less significant improvement might be relevant to participants' preference of interpreting idioms. Although an idiom's overall expression can sometimes be arbitrary and has little relation with its constituent words, knowing the literal meanings of its constituents could be important for L2 idiom processing. Lexical processing research (e.g., Senaldi & Titone, 2022) revealed that L2 learners preferred an analytic to a direct-retrieval path in terms of processing L2 idioms. Consequently, participants of the experimental group might prioritize the lexical analytic part of the L2 idiom instruction, regardless of the enhancement.

The Effect of Enhancement for Congruence-Available Cross-Language Overlaps

As for L2 idiom learning in congruence-available scenarios, this study also observed an overall learning improvement, with an increase of 8.42 to 11.41 words found for the control group and a higher increase of 8.46 to 11.92 words found for the experimental group. Results of the mixed-effects model found a main effect for the group type, suggesting that the difference between the instructional effects was significant. Woven together, these results indicated that participants of the experimental group benefited from the CLO enchantments conveyed through the instruction. To note, the current study resulted in learning gains for both the control and the experimental groups, despite that the increase for the control group was not significant enough. This finding is consistent with Titone and colleagues' (2015) conclusion that semantic CLO counterparts may facilitate L2 idiom processing. As an extension to Titone and colleagues' (2015) experiment that built on French-English cognates where CLOs were at a word-to-word level, the current study revealed that the effect of semantic CLOs remained influential for logographic-alphabetic idioms. This facilitatory effect, however, contradicted Beck and Weber's (2016) results based on two priming experiments. With a comparison between German English learners' response to word-to-word and post-lexical L2 idioms, they reported no significant processing advantages for the word-

to-word congruency. This is probably because there was no deliberate instructional cue given to the participants of the priming test, whereas CLOs were highlighted for participants of the current study.

The significant enhancement effect found in the current study was consistent with pedagogical studies aiming at drawing students' attention to L2 forms and structures (Cintrón-Valentín & García-Amaya, 2021; Dang et al., 2022; Zuo, 2021). As Cintrón-Valentín & García-Amaya (2021) suggested, increasing salience was an effective approach for teaching abstract L2 features such as grammatical structures. In a captioned media designed form-focused instruction, they found that the learning of some (but not all) target L2 Spanish grammatical structures was more conducive to textual enhancement. Similarly, Zuo (2021) suggested that L2 learners might ignore the idiomatic nature of a phrase without noticing semantic meanings of its constituents. By comparing Chinese English learners' L2 idiom reading comprehension in different conditions, the author found that participants always performed better with the semantic enhancement.

The Retention Effect

In addition to the facilitatory effect, the current study observed a retention effect in both congruence-available and incongruent CLO scenarios. In the congruent model, the main effect was found for interactions between the experimental group and pretest baseline but not for the delayed posttest, indicating no significant score variance of the delayed test. Similarly, the main effect was found for Time (Pre) in the incongruent model.

These findings were in line with Boone and colleagues' (2023) longitudinal study in terms of L1-L2 congruency. They reported that participants' knowledge of novel congruent collocations will be retained one year, and their knowledge of incongruent collocations may increase long-term, whereas the current study did not obtain the learning loss from the immediate posttest to the delayed posttest suggested by Zou and Teng (2023). There are two reasons to explain this. First, in terms of the enhancement technique, the current study utilized a different strategy. Although the goal of all enhancement instructions was to increase salience, Zou and Teng's (2023) treatment, as they suggested, had involved too many stimuli that might hinder their recalling. The current study raised participants' attentions through only verbal instruction so that the pedagogical purpose was clearer. Second, the current study adopted a pair-associate learning (PAL) paradigm that deliberately raised participants' attentions to the semantic and conceptual meanings, where L2 learning in Zou and Teng's (2023) was more autonomous and self-learning centered. It is therefore possible to suggest that the teacher's instructions might have also played an important role in longer idiom memorization.

Conclusion and Implications

While the current study produced significant findings, it has several limitations. First, to avoid the inference of other factors, this study adopted a direct instruction fashion. It is notable that different task types (Rabie-Ahmed & Mohamed, 2022; Yanagisawa & Webb, 2021) will facilitate L2 collocation differently. The current study, however, had not incorporated these pedagogical conditions. Second, to examine the instruction effectiveness, the degree of idiom familiarity and transparency were manipulated to an intermediate level where participants would not rely on their previous knowledge or anticipate meanings through lexical components. Apart from idiom familiarity and transparency, other idiom features such as decomposability, salience and imaginability may also affect L2 idiom processing (Cieślicka & Heredia, 2011; Giora, 2003; Ramonda, 2022). Therefore, caution should be taken when generalizing the findings of the present study.

A number of areas need attention in future research. Given that a presumptuous reliance on quantitative data might lead to overgeneralization, and every L2 classroom is a dynamic habitat, the inclusion of qualitative and mixed method designs should be encouraged for future research (Riazi & Farsani, 2024). The involvement of quantitative data regarding instructors' belief profiles and curriculum ideologies before and after the instruction, along with an in-depth investigation of learners' lexical building experience, may corroborate the results concluded by the quantitative data and better address different dimensions of L2 idiom learning in an EFL context. Also, the interaction between lexical and phrasal congruence is another interesting issue to inspect. While some lexical processing studies suggested that semantic congruence between L1 and L2 idioms might lead to a faster L2 idiomatic interpretation, evidence from the collocation research revealed that L1 syntactical patterns were easier to be identified in their L2 translations. It is therefore worthy to further explore how L2 idioms are processed with the presence of both overlapped L1-L2 lexical and syntactical counterparts. Additionally, it would be pedagogically useful for future studies to examine how multimodal mediated instructions may contribute to L2 idiom teaching. Being that recent incidental learning research reported the effectiveness of video-assisted instruction for L2 lexical development (e.g., Dang et al., 2022), it is plausible that deliberate instructions built on customized video clips might better facilitate L2 idiom learning.

With respect to L2 idiom teaching in classrooms, language teachers' hands (in particular those in EFL context) are usually full. Activities popular in English as a Second Language (ESL) classrooms were sometimes ineffective due to different instructional habits (Upadhaya & Sudharshana, 2021) and the limited amount of teaching time (Lightbown & Spada, 2020). Meanwhile, the findings of the present study suggested that both lexical and syntactical congruent counterparts existing in L1-L2 idiom phrases might lead to a facilitatory effect for L2 idiom learning. Language teachers and educators wishing to apply such features are advised to spare some effort preparing semantically matched L1-L2 idiom phrases for L2 idiom teaching. Moreover, in conventional EFL settings where instructions regarding L2 idiomatic knowledge are occasionally needed and often spontaneous, it is useful to bear in mind that the L2 idiomatic meanings might be better comprehended when paired with a similar L1 expression. Also, it is advisable to suggest that raising students' awareness to similar semantic counterparts between the L1 and L2 idiom phrases could be significantly beneficial, despite their individual contributions to the entire expression.

Acknowledgement

We thank Editor Prof. Karim Sadeghi, as well as two anonymous reviewers for very helpful comments. We are also grateful to Anthony J. Singleton for very useful discussions and suggestions.

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Appendix

Supplement Table 1. Congruence Available and Incongruent L1-L2 Idioms

Incongruent Idiom Pairs		Congruence Available Idiom Pairs	
make heavy weather of	小题大做	spilled water is not picked up again	覆水难收
pick holes	吹毛求疵	love me, love my dog	爱屋及乌
six of one and half a dozen of the other	半斤八两	give him an inch and he will take a yard	得寸进尺
go for the gloves	孤注一掷	chatter like a magpie	喋喋不休
all one's geese are swans	敝帚千金	hang by a hair	千钧一发
carry coals to Newcastle	画蛇添足	kill two birds with one stone	一石二鸟
poor as a church mouse	一贫如洗	look for a needle in a haystack	海底捞针
ride the high horse	趾高气扬	walls have ears	隔墙有耳
throw straws against the wind	螳臂当车	drunk as a fiddler	酩酊大醉
birds of a feather	一丘之貉	on pins and needles	如坐针毡
hit the ceiling	怒发冲冠	shut he stable-door when the steed is stolen	亡羊补牢
a flash in the pan	昙花一现	a misfortune and a friar seldom go alone	福无双至，祸不单行
cut one's own throat	作法自毙	money makes the mare go	有钱能使鬼推磨
between the devil and the deep sea	进退维谷	be called to one's eternal rest	与世长辞

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