行政院國家科學委員會專題研究計畫　成果報告

感知突出性、元語言學知識、及分類對學習英文語彙搭配詞的成效實證研究

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※ 感知突出性、元語言學知識、及分類 ※
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感知突出性、元語言學知識、及分類
對學習英文語彙搭配詞的成效實證研究

Effects of Perceptual Salience, Metalinguistic Knowledge, and Sorting on Learning English Lexical Collocations: An Empirical Study

摘要

本計劃為期一年，是研究「感知突出性」、「元語言學知識」、和以「元語言學知識」為基準的「分類學習活動」，對學習英文「動詞+名詞片語」之語彙搭配詞的成效之實證研究。

參與本研究的受測者，為五十七位非英文系的大一學生。在一年中，於不同時間，進行三次教學實驗，以了解老師可如何增強「標的搭配詞」的輸入(input)，以協助學習者將「標的搭配詞」存放在暫時記憶中，內化後，將來隨意取出使用。第一次實驗，由老師提供有加註記之二十四個句子，主要在探討這種方式能否引起學習者對「標的搭配詞」的特別注意，而將其印入腦中。第二次實驗，目的與第一次實驗相同，除由老師提供與前次實驗完全不同、有加註記二十四個句子外，並將搭配詞及「標的搭配詞」的形義關係進加以詳盡的介紹與分析。第三次實驗，前兩個步驟與第二次實驗相同，先由老師提供與前兩次實驗均不相同、有加註記之二十四個句子，然後將「標的搭配詞」之形義關係加以分析，但最後另由受測者將文中之「標的搭配詞」按形義分類。

三次實驗中所用之測試工具，是三份各有二十四題的搭配詞填充測驗卷。每一個空格要填的，是可以和名詞連用的動詞搭配詞。每一份測驗卷，均有八題中、英文相似的搭配詞類型；八題中、英文相異且含有 take、make 等動詞的搭配詞類型；以及八題中、英文相異且不含有 take、make 等動詞的搭配詞類型。

本研究的結果顯示：將搭配詞用底線註記，可成功地讓「標的搭配詞」更醒目、並吸引學生的注意力到某個程度。但是，「感知突出性」結合「元語言學知識」，較單一的「感知突出性」來得有效。受測者因了解「標的搭配詞」與其相對應的中文搭配詞之相似和相異之處，結果受測寫出的成績，在中、英文相同和中、英文不同的兩類搭配詞上，均有顯著地進步。不過，最有效的，是「感知突出性」結合「元語言學知識」，和以「元語言學知識」為基準的分類學習活動，使受測者對不同形義關係類型的「動詞+名詞片語」的搭配詞，具有更佳的敏銳度。

另外，在結果中，中英文不同，含有 take、make 這一類動詞的搭配詞類型，在實驗開始時，表現最佳；但在實驗結束時，進步最少。可能的原因是，這類搭配詞像片語，較易受到注意，所以在實驗之初，已習得相當程度，繼續進步的空間較小。至於中、英文相同的搭配詞類型，在實驗開始時，表現最差，但在整個實驗結束時，進步最多。合理的解釋是，受測者的英文程度僅具中低級，仍處於「正向遷移」 (positive transfer) 對其中介語言系統，具有較大影響力的階段。

理論上來說，本研究讓我們瞭解「感知突出性」、「元語言學知識」、和以「元語言學知識」為基準的「分類學習活動」，是如何交互影響，而促進學習者對搭配詞的指認、記憶和學習的。就實際教學層面而言，本研究結果發現，老師可藉由教學技巧和教材的設計，有效地吸引學生去注意和學習不同形義類型的搭配詞。

關鍵字：感知突出性、元語言學知識、分類、語彙搭配詞

Abstract

This one-year project is a study of the facilitative effects of perceptual salience, metalinguistic knowledge, and a metalinguistic knowledge-based classification activity on learning the English Verb + Noun lexical collocations.

Fifty-seven non-English-major freshmen participated in the study. Three experiments were conducted at different times of the year to understand how different kinds of input enhancement may help learners notice the target collocations, store them in working memory, and internalize them for future retrieval and reproduction. The first experiment investigated the usefulness of highlighting the targeted collocations in increasing their perceptual salience. The second experiment investigated the role of explicit instruction in developing learners' awareness of the form-meaning relations of V + N collocations. The third experiment investigated the effect of a metalinguistic knowledge-based classification activity on learners' internalization of the target V + N collocations.

The instruments used in the three experiments were three fill-in-the-blank collocation tests, each containing twenty-four items. For each item, the participants needed to think of a verb collocate that could go with its following noun phrase. In each test, there were eight literal V + N collocations, eight non-literal delexicalised V + N collocations, and eight non-literal non-delexicalised V + N collocations.

The results of the study indicated that highlighting the V + N collocations succeeded in making the target collocations noticeable to the participants and drawing the participants' attention to the V + N collocations to a certain extent. Compared with perceptual salience, the combination of perceptual salience and metalinguistic knowledge worked more effectively than perceptual salience alone. An awareness of the similarities and differences between the target V + N collocations and their L1 counterparts contributed to an increase in the improvement of both literal and non-literal V + N collocations. However, the most effective is a combination of perceptual salience, metalinguistic knowledge, and a metalinguistic knowledge-based classification activity, which contributed to an increased sensitivity to the various form-meaning relation patterns of V + N collocations.

There are two unexpected findings. First, the non-literal delexicalised subtype, which was associated with the highest mean at the onset of the study, was improved least. Second, the literal subtype, which was associated with the lowest mean at the onset of the study, was improved most. An explanation for the former is that the non-literal delexicalised collocations, being more phrase-like in form and thus more noticeable, had been acquired to such an extent that there was not much room for its further improvement. An explanation for the latter is that the participants, whose English proficiency was that of a lower-intermediate one, were still at a stage when positive transfer still exerted a greater influence on the participants' interlanguage system.

Theoretically, this study can contribute to a better understanding of

how perceptual salience, metalinguistic knowledge, and a classification activity can interact to facilitate learners' identifying, retaining, and learning English V + N collocations. Practically, this study can provide a guide as to how to design teaching techniques and materials that may effectively draw learners' attention to various types and subtypes of V + N collocations in the input.

Keywords: perceptual salience, metalintuistic knowledge, sorting, lexical collocations

INTRODUCTION

Lexical collocations had long been neglected for two important reasons: first, learners in general pay attention to the meaning of collocations in input instead of its linguistic features; second, lexical collocations, being more transparent in meaning and less salient in form than idioms, are easy to understand. Thus, collocations are not regarded important in English learning.

Nevertheless, more and more researchers began to notice the role of collocations in the productive use of English. Some found a positive correlation between knowledge and use of English collocations and the quality of college students writing (e.g., Zhang, 1993; Al-Zahrani, 1998). Others even noted that learners' collocational competence is specifically related to their English fluency, accuracy, naturalness, and conciseness (Conzett, 2000; Graney, 2000; Hill, 2000; Lewis, Morgan, 2000; Zhang, 1993).

As collocational competence attracted more attention, some teachers began to study the reason why native speakers can use English more effectively than foreign learners. A recent study (Hill (2000) found that native speakers have a much larger store of fixed and semi-fixed expressions than that of foreign learners. But the results of an earlier study (Bahns and Eldaw, 1990) showed that collocation does not grow in proportion to the increase of vocabulary. In other words, learners with a large vocabulary may not necessarily have a large store of mental lexical collocations. So, how to apply cognitive theories in facilitating learners' acquisition of collocations has become an interesting issue.

In examining the related literature closely, we note that in collocation instruction a number of principles and techniques have been affected by the concepts of quality input and input processing. But most of them are just classroom experiences that have not been empirically tested. Hill (2000), for example, suggested that the teacher should help learners identify the correct target collocations in the texts. He believed that only quality input would lead to future success. Morgan Lewis (2000), on the other hand, maintained that learners ought to be provided with natural collocations not artificially invented for classroom teaching. Aside from these teaching principles, there was a call for attention to the non-literal collocations (Lewis, 2000a); a recent study (Liu, 2001) has found its positive effect on improving students' expressive competence in English writing. With regard to collocation learning, Lewis (2000b) stressed the importance of consciousness-raising, claiming that both "noticing" and "sorting" are more effective than "describing".

With the above pedagogical principles and suggestions in mind, the researcher of this project intends to investigate the function and interaction of perceptual salience, metalinguistic knowledge, and "sorting" (i.e., classification) in enhancing learners' collocation input. Their applicability in a classroom learning environment will be evaluated.

Purposes

This one-year project is to investigate the effects of perceptual

salience, metalinguisitc knowledge, and sorting in promoting learners' recognition, awareness, and acquisition of V + N collocations. In other words, the project aims to study how different kinds of input enhancement may help learners notice the target collocations, store them in working memory, and internalize them for future retrieval and reproduction.

Specific goals are: (a) explore the role of perceptual salience: how useful is it to highlight the targeted collocations, the V + N collocations? Can it help learners focus their attention on those target collocations? (b) understand the function of metalinguistic knowledge: can explicit instruction that deals with form-meaning relations of V + N collocations increase learners' awareness of the target collocations? (c) investigate the effect of sorting: can a task that requests learners to classify V + N collocations according to their form-meaning relations facilitate their acquisition of the target collocations?

LITERATURE REVIEW

Definition of Collocation

In this study, collocation is "the company that a word keeps" (Firth, 1957). It is the way in which words co-occur in natural text in statistically significant way (Lewis, Morgan, 2000). The co-occurrence of words is a matter of degree (Lewis, 1993). For example, both "golden opportunity" and a "nice sweater" are natural collocations but "golden" and "opportunity" collocate strongly, whereas the linking of "nice" and "sweater" is much weaker.

Being linguistic and not thematic, collocation is about words that co-occur, not ideas or concepts. Therefore, in Britain people "drove cars", but in English they would say, "I brought the car" (Lewis, 1997). From this example, we can see that collocation is arbitrary. It is not consistently interpretable in terms of its constituent parts (Singleton, 1999). For instance, "heavy smoker" cannot be interpreted as "nicotine-user with a weight problem."

With regard to the collocability of words, some are more restricted than others. For example, "have" can enter into partnership with a vast range of other words, whereas "rancid' can collocate with only a few words like "butter" and "oil" (Singleton, 1999).

Some lexicographers (e.g., Benson & Ilson, 1986) distinguish between lexical collocations such as "suggest an alternative" and grammatical collocations such as "aware of". While lexical collocations combine two lexical words, grammatical collocations combine a lexical word, typically a noun, verb, or adjective, and a grammatical word (Lewis, Morgan, 2000).

Attention and Learning

In psychology, it is posited that unattended stimuli persist in short-term memory for only a few seconds. There is little learning without attention (Baars, 1988, 1996; Carlson & Dulany, 1985; Fisk & Schneider, 1984; Posner, 1992; Velmans, 1991).

In SLA, there is now general consensus that access to comprehensible input, and processing for meaning alone are not sufficient conditions for attaining native-like knowledge of a L2, and that some attention to language form is necessary (Long & Robinson, 1998; Spada, 1997; and Doughty, 2001). Some researchers argued that many features of L2 input are non-salient and communicatively redundant. Without attention, input may become unavailable for further mental processing (Carr & Curran, 1994; Gass, 1988; van Lier, 1991, 1994; VanPatten, 1994).

Skehan (1998), in discussing foreign language aptitude, maintained that the ability to notice what is in the input (Sawyer & Ranta, 2001) is one of the three factors in foreign language aptitude.

The Noticing Hypothesis

Schmidt (1990; 1993a; 1993b; 1994; 1995) proposed the Noticing Hypothesis but preferred the stronger to the weaker version. The weaker version posits that learners do not have to notice any details of its form, and that all they need to be aware of is the input in a global sense (Truscott, 1998). The stronger version, in contrast, posits that second language input does not turn into intake if it is not noticed, and that noticing requires a conscious apprehension and awareness of input. As advocates of noticing, Schmidt and Frota (1986) emphasized the importance of the concept of "noticing the gap," which refers to learners' awareness of a mismatch between the input and their existing interlanguage. They considered this conscious awareness of the gap a requirement.

The Weak Interface Position

Krashen (1981) promoted the non-interface position and argued that explicit knowledge cannot convert into implicit knowledge no matter how much is practiced. He maintained that the former is learned, but the latter is acquired. Some applied linguists (e.g., Stevick, 1980; Sharwood Smith, 1981; Gregg, 1984) disapproved this concept and advocated the strong interface position that explicit knowledge can convert into implicit knowledge and vice versa.

The weak interface position, on which the Noticing Hypothesis is based, claims that explicit knowledge that is derived from instruction may convert into implicit knowledge, but that it happens only in the case of non-developmental grammatical rules, or in the case of developmental rules when the learner has reached the stage of acquisition that allows for integration of the new rule into the interlanguage system.

Relationship Between Explicit and Implicit Knowledge

Ellis (1994) suggested that the process by which input turns into implicit knowledge involves two stages. The first stage involves the operations of noticing and comparing. Learners pay attention to specific linguistic features in the input and compare them with their existing interlanguage representation. In the second stage, learners use the information from noticing and comparing to modify their interlanguage systems. The modification of interlanguage rules takes two forms: either learners revise hypotheses and develop their implicit L2 grammar, or they place features in storage until some subsequent time when they can fully incorporate them into their interlanguage systems. Generally speaking, new words and formulaic chunks, for instance, can be more easily added to the system than those involving reconstruction of the existing system.

Studies on Input Enhancement

Perceptual Salience

Perceptual salience of input refers to the prominence of a form in input. According to Skehan (1998), the more salient a form is, the more likely it is to attract attention. Since Sharwood Smith (1981) advocated the use typographical enhancement to help learners notice the non-salient target forms in the input, several other researchers have investigated the effect of perceptual salience on second language learning. Their findings are different. Jourdenais et al. (1995), in their studies of L2 Spanish preterit and imperfect endings, found a significant difference in noticing of target forms and accuracy of output. White (1998), in her study of L2 English third person singular possessive determiners, noted that drawing learners' attention to a linguistic feature can speed up their

acquisition of that feature, but that implicit FonF instruction may not be adequate in cases where there are L1-L2 contrasts. White suggested that learners should be given more explicit information about the L1-L2 contrasts in order to make more advanced progress.

Input Processing

VanPatten and Cadierno (1993) stressed the use of tasks that facilitate the development of input processing skills. They asked their subjects to practice interpreting OVS strings in L2 Spanish when the O consists of a full noun and when it consists of a clitic object pronoun. The results of their study showed that the subjects receiving processing instruction did better than the other two groups on a comprehension task.

Output Enhancement

The effects of output on noticing have been investigated by some pedagogically- oriented researchers. According to Swain's Output Hypothesis (1985, 1993, 1995), when learners actually produce the target language and experience communication difficulties, they would be pushed to find better expressions for their intended meanings. So, output has three functions. First, it can be used to test learners' hypothesis about the target language and examine the linguistic well-formedness of their interlanguage by checking it against the feedback from their interlocutors. Second, it may have a metalinguistic function, enabling learners to internalize linguistic knowledge. Third, it can help learners notice a gap between what they intend to say and what they actually say, that is, to notice their linguistic problems.

Although Krashen (1998) warns us that auto-input does not contribute to language acquisition, Ellis (1997) suggests that it may be necessary for learners to produce output in order to test their hypothesis and notice the gap between their own production and the target.

Metalinguistic Knowledge

An important role of explicit instruction is to help learners focus their attention on forms and meanings in the input and facilitates subsequence processing (de Graaff, 1997; N.Ellis, 1993; R. Ellis, 1994; Hulstijn & de Graaff, 1994; Long, 1988; Terrell, 1991; Tomlin & Villa, 1994; VanPatten, 1994). Metalinguistic knowledge of L2 can be acquired through instruction. Although metalinguistic knowledge may not directly alter the structure of the learner's interlanguage (Sharwood Smith, 1981), it can be used to monitor the output generated by the acquired interlanguage (Lightbown, 1998) and inhibit negative transfer of L1. Williams (1995) found that input enhancement, together with explicit instruction in the form of metalingual explanations and corrective feedback, is more effective than sheer input enhancement. In terms of age, however, this kind of metalinguistically oriented focus on form that relies on the transmission of abstract rules was found to be beneficial to adults instead of children (Harley, 1998).

Linguistic Knowledge

Learner's existing linguistic knowledge may play a role when they choose to notice some features than others (Ellis, 1997). If a feature is too difficult for learners, it will be ignored. Pienemann's Teachability Hypothesis (1985) provides guidance with respect to this problem. It suggests that the teacher should not demand a learning process that is impossible at a given stage and that "an L2 structure can be learnt from instruction only if the learner's interlanguage is close to the point when this structure is acquired in the natural setting" (Pienemann, 1984: 201). Williams and Evans (1998) conducted an experiment on which forms to choose for FonF activities. They noted that more explicit treatment seemed to be better suited to relatively

simple rules and forms and that in order for the more explicit treatment to be effective, the learners have to be ready for it.

Timing for Focus on Form

Lightbown (1998) explores the issue of timing by examining the relationship between developmental stages and focus on form. She admitted that learners benefit only from developmentally matched instruction. But there is more and more evidence that FonF instruction can move learners along the sequence more quickly than they could move without it and lead them further toward mastery (Long, 1991, 1996).

Studies on Collocation Learning and Teaching

As more and more teachers became aware of the importance of collocations in English learning, research started to deal with the issue of collocation learning and teaching. Conzett (2000), for example, maintained that explicit collocation teaching is necessary and helpful to learners. It may cause learners to notice the undifferentiated input, leading to future progress (Skehan, 1998).

With respect to techniques for teaching collocations, many researchers suggested that the teacher should help learners identify collocations in texts. Woolard (2000), for instance, asked learners to find a verb and adjective in the text that collocates with the word "views." Hill (2000) requested learners to underline all the V + N collocations in a text or to find as many collocates of a typical noun as they can to raise learners' awareness of collocations. He believed that if collocations are to be correctly stored and retrieved for future use, they have to be identified correctly in the first place.

Limited by the amount of time available for second language learners, it is also important for teachers to provide learners with only good examples that are natural and often spoken (Lewis, 2000b). It is noted that only natural examples could promote acquisition (Lewis, 2000b) and that only good quality input would lead to good quality retrieval (Hill, 2000). Therefore, teachers should avoid inventing artificial examples for classroom teaching. If authentic examples are unavailable, concordance lines may be a good source of natural collocations.

Addressing the issue of what collocations to learn, Lewis (2000b) suggested that the teacher should select and direct learners' attention to particular kinds of examples. Woolard (2000) tried to draw learners' attention to the combinations that he considered they would not expect to find together: for example, he focused learners' attention on collocations like "heavy smoker" instead of "heavy loads." He also approved what Brown (1994) suggested: the teacher may use learners' miscollocations as a good index of the ones that need to be learned. One type of common V + N miscollocations is the combination of a delexicalised verb "make" or "do" and a noun (see also Hill, 2000).

Willis and Willis (1996), on the other hand, proposed that learners should be encouraged to explore the similarities and differences between patterning in English and that of their own language (Willis & Willis, 1996). According to Lewis (2000a), while some collocations appear transparent and superficially "logical", many are conventional with a partially non-literal, metaphorical or idiomatic element. Therefore, word-for-word translation fails to work for the latter type of collocations, and the use of different wording is necessary in translating this type of collocations.

With respect to the way of learning collocations, Lewis (2000b) argued that noticing and sorting are more important than describing. He considered that it is a waste of time to spend many classroom hours verbalizing grammatical

patterns. He claimed that noticing language helps, sorting language into categories or patterns may help, but describing the categories almost certainly does not.

Hill (2000) concludes, after realizing that native speakers can speak very fast because they have access to a vast store of fixed expressions and collocations, that more studies on memory are needed for exploring the ways of increasing learners' memory for idiomatic expressions and collocations.

Research Questions

Experiment 1

1. Provided the highlighted target collocations to process, will the participants notice the target collocations more easily and retain them more successfully by being able to subsequently reproduce them?
2. Exposed to the more salient input, will the participants show more sensitivity to the various form-meaning patterns of the V + N collocations by being able to subsequently produce each type of V + N collocations successfully?

Experiment 2

1. Given explicit instruction that contains metalinguistic knowledge of V + N collocations, will the participants show more noticing of those collocations in general and be able to subsequently produce them successfully?
2. Will the participants, after receiving an explicit instruction, show more sensitivity to the various form-meaning patterns of the V + N collocations by being able to subsequently produce each type of them successfully?

Experiment 3

1. Requested to do a classification task after receiving explicit instruction, will the participants show more noticing of those collocations in general by being able to subsequently produce them successfully?
2. After doing a task of classifying the V + N collocations into different form-meaning patterns based on the acquired metalinguistic knowledge, will the participants show more sensitivity to the various form-meaning patterns of the V + N collocations by being able to subsequently produce each type of them successfully?

METHODOLOGY

Participants

Fifty-seven non-English-major freshmen participated in the study. All of them had studied English for more than six years, and their English proficiency was that of a lower intermediate level. To avoid group bias and to ensure that the participants were equivalent at the start, the subjects were chosen on the basis of the grades they got for their English midterm examination. Those whose grades were lower than sixty were excluded.

Instrument

For each of the three experiments, the testing instrument consists of twenty-four fill-in-the-blank items. For each blank, the learners need to think of a verb collocate that can go with the following noun phrase. Of the twenty-four collocations, eight of them are literal collocations; the other sixteen are non-literal collocations. The latter category contains two further subcategories: eight of the sixteen non-literal collocations are made up of a headword and a delexicalised verb collocate like "make" and "take"; the other eight non-literal collocations are made up of a headword and a non-delexicalised verb collocate (i.e., a verb that is not delexicalised). To avoid the practice effect, the researcher gave participants completely different tests in the three experiments. The test items

are selected from the authentic readings on the Internet.

Tasks and Procedures

Experiment 1

In Experiment 1, the participants were asked to study twenty-four sentences that contain V + N collocations. They were told to process the highlighted collocations twice, with the first focusing on their meanings and the second on their forms. The participants were allowed to use any dictionary when they had difficulty understanding the meanings of the target collocations. Then the learning materials were collected, and the participants were given a twenty-four fill-in-the-blank collocation test to do. The participants were requested to provide each blank with a verb collocate that can go with the following noun phrase.

Experiment 2

In Experiment 2, the participants were given explicit instruction on the concept of collocations. They will be provided with examples of two types of V + N collocations: the literal-collocations that conform to the literal translation of their Chinese counterparts and the non-literal collocations that are different from their Chinese counterparts in form. Then they were shown two further subcategories of the latter type: those that are composed of a headword preceded by a delexicalised verb like "take" and "have" and those that are composed of a headword preceded by a non-delexicalised verb, that is, a verb that has its own meaning.

After receiving the explicit instruction of V + N collocation, the participants were given twenty-four sentences to study. They are completely different from the ones they had studied in Experiment 1. Each of the sentences contains a highlighted V + N collocation. The participants were told to process all the collocations twice, with the first focusing on their meanings and the second on their forms. They were allowed to use any dictionary when they had difficulty understanding the meanings of the target collocations.

After the learning period, the learning materials were collected, and the participants were asked to do a twenty-four fill-in-the-blank collocation test. They were requested to provide each blank with a verb collocate that can go with the following noun phrase.

Experiment 3

In Experiment 3, the participants were first given a review of the concept of collocation. Then they were given twenty-four sentences to study. The sentences are different from the ones they studied in Experiments 1 and 2. They were also told to do tasks partly different from what they were requested to do in Experiment 2. The participants were asked to process the sentences twice, with the first still focusing on the meanings of the highlighted collocations, but the second on an analysis of their form-meaning relation patters. For the first process, the participants were allowed to use a dictionary for difficult words. For the second process, the participants were asked to first classify the V + N collocations into literal and non-literal collocations and then to further classify the non-literal collocations into those that contain delexicalised verb collocates and those that contain non-delexicalised verb collocates.

After the learning period, the learning materials were collected, and the participants were asked to do a twenty-four fill-in-the-blank collocation test. They were requested to provide each blank with a verb collocate that can go with the following noun phrase.

RESULTS

A comparison of the means of the three tests by a Friedman Two-way Analysis of Variance indicated that the

three test results (Table 1) were significantly different from one another with a Chi-square value of 67.57($p < 0.0001 < \alpha = 0.05$).

Table 1. Means of the Three Tests

	Mean	Std Dev
Test 1	15.32	5.148
Test 2	19.04	4.60
Test 3	21.54	2.54

Total number of test items = 24
Chi-square Value = 67.57 $p < 0.0001 < \alpha = 0.05$

Further separate comparisons of the means of each of the four V + N collocation subtypes (i.e., literal collocations, non-literal collocations, and non-literal delexicalised collocation subtype and non-literal non-delexicalised collocation subtype) over the three tests showed that the performances on each of the subtypes were also significantly different from one test to another (literal: Chi-square value = 49.36; $p < 0.0001 < \alpha = 0.05$; non-literal: Chi-square value = 54.76; $p < 0.0001 < \alpha = 0.05$; non-literal delexicalised: Chi square value = 48.04; $p < 0.0001 < \alpha = 0.05$; non-literal non-delexicalised: Chi-square value = 47.05; $p < 0.0001 < \alpha = 0.05$) (Table 2).

Table 2. Mean Performance on V + N Collocation Subtypes in the Three Tests

Mean Performance		A. Literal Collocation (N = 8)	B. Non-literal Collocation (N = 16)	B1. Non-literal Delexicalised Collocation (N = 8)	B2. Non-literal Non-Delexicalised Collocation (N = 8)
T1	Mean	4.32	11	6.33	4.67
	Std Dev	2.28	3.36	1.75	2
T2	Mean	5.6	13.44	7.14	6.3
	Std Dev	2.19	2.8	1.3	1.7
T3	Mean	6.88	14.67	7.89	6.77
	Std Dev	1.17	1.69	0.4	1.51
Chi-square Value		49.36	54.76	48.04	47.05
P-value		$< 0.0001 < \alpha = 0.05$	$< 0.0001 < \alpha = 0.05$	$< 0.0001 < \alpha = 0.05$	$< 0.0001 < \alpha = 0.05$

T= Test N = Number of Test Items

An examination of the improvement made in the second test revealed that perceptual salience plus metalinguistic knowledge worked more effectively than perceptual salience alone. In Test 1 of Experiment 1, after the participants processed the highlighted target collocations twice, first for meaning and later for form, the mean number of items answered correctly was 15.32 (Table 1). But in Test 2 of Experiment 2, after the participants received metalinguistic knowledge of the target V + N collocations and subsequently processed the highlighted learning materials in the same way they did in Experiment 1, the mean increased to 19.04 (Table 1). A paired samples t-test revealed that the difference between the two means (3.72) was significant ($t = 5.66$; $p < 0.0001 < \alpha = 0.05$) (Table 3).

In terms of the two subtypes of V + N collocations, the literal and the non-literal, the participants also made significant improvement on both with a mean difference of 1.28 for the former ($t = 4.24$; $p < 0.0001 < \alpha = 0.05$) and a mean difference of 2.44 for the latter ($t = 5.32$; $p < 0.0001 < \alpha = 0.05$) (Table 3).

In terms of the two subtypes of non-literal V + N collocations, the non-literal delexicalised and the non-literal non-delexicalised, the participants made a significant improvement only on the latter with a mean difference of 1.63 ($t = 5.93$; $p < 0.0001 < \alpha = 0.05$). Their improvement on the former, a mean difference of 0.8, was not statistically significant ($t = 3.05$; $p = 0.0035 > 0.0001$) (Table 3).

Table 3. Mean Improvement on V + N Collocation Type/Subtypes in Test 2

Collocation Type/Subtype	No. of Test Items	Mean Difference	T-value	P-value
V + N Collocation Type	24	3.72	5.66	< 0.0001
Literal	8	1.28	4.24	< 0.0001

Collocation Subtype				
Non-literal Collocation Subtype	16	2.44	5.32	< 0.0001
Non-literal Delexicalised Collocation Subtype	8	0.8	3.05	0.0035
Non-literal Non-delexicalised Collocation Subtype	8	1.63	5.93	< 0.0001

With regard to the comparative effect of the combination of perceptual salience and metalinguistic knowledge on learning the subtypes of V + N collocations, the improvement made on the non-literal non-delexicalised V + N collocation type (0.82%) was significantly greater than that on the non-literal delexicalised V + N collocation type ($t = 2.90$; $p = 0.0053 < 0.01 < \alpha = 0.05$), but the improvement made on the literal V + N collocation type (0.0077%) was not significantly greater than that on the Non-literal V + N collocation type (Table 4).

Table 4. Paired Comparison of Mean Improvement on V + N Collocation Subtypes in Test 2

Subtypes Compared	Mean Difference %	T-Value	P-Value
Literal vs. Non-literal V + N Collocation Subtype	0.0077	0.22	0.8271
Non-literal non-delexicalised vs. Non-literal delexicalised V + N Collocation Subtype	0.82	2.90	0.0053 < 0.01 < α = 0.05

An examination of the improvement made on Test 3 (Table 5) indicated that perceptual salience plus metalinguistic knowledge and a metalinguistic knowledge- based classification activity worked even more effectively than perceptual salience plus metalinguistic knowledge.

In Test 2 of Experiment 2, after the participants received metalinguistic knowledge of the target collocations and then processed the highlighted learning materials twice for meaning first and then for form, the mean number of items answered correctly was 19.04 (Table 1). However, in Test 3 of Experiment 3, after a brief review of the relevant metalinguistic knowledge of the target collocations, and a subsequent activity that requires the classification of the target V + N collocations into different categories and subcategories (i.e., literal and non-literal collocations; non-literal delexicalised and non-literal non-delexicalised collocations), the participants scored a mean of 21. 54 (Table 1) and made a significant increase of 2.51 ($t = 4.87$; $p < 0.0001 < \alpha = 0.05$) (Table 5).

In terms of the two subtypes of V + N collocations, the participants improved significantly only on the literal collocations (MD = 1.28; $t = 4.24$; $p < 0.0001 < \alpha = 0.05$) (Table 5). In terms of the two subtypes of non-literal collocations, the participants made significant improvement only in non-literal delexicalised collocation type (MD = 0.75; $t = 4.69$; $p < 0.0001 < \alpha = 0.05$) (Table 5).

Table 5. Mean Improvement on V + N Collocation Type/Subtypes in Test 3

Collocation Type/Subtype	No. of Test Items	Mean Difference	T-value	P-value
V + N Collocation Type	24	2.51	4.87	< 0.0001
Literal Collocation Subtype	8	1.28	4.24	< 0.0001
Non-literal Collocation Subtype	16	1.23	3.76	0.0004
Non-literal Delexicalised Collocation Subtype	8	0.75	4.69	< 0.0001
Non-literal Non-delexicalised Collocation Subtype	8	0.47	2.06	0.0437

With regard to the comparative effect of the combination of perceptual salience, metalinguistic knowledge, and the metalinguitic knowledge-based classification activity on learning the subtypes of V + N collocations, it was noted that the participants not only made greater improvement on literal collocations than on non-literal collocations (MD = 0.08%; t = 2.66; p = 0.0101 < α = 0.05) but also improved more on the literal collocations than on the non-literal delexicalised collocations (MD = 0.526 %; t = 2.03; p = 0.0469 < α = 0.05) or on the non-literal non-delexicallised collocations by 0.807% (t = 2.79; p = 0.0072 < α = 0.05). The improvement made on the non-literal delexicalised V + N collocation type was similar to the improvement made on the non-literal non-delexicallised V + N collocation type (MD = 0.28%; t = 1.25; p = 0.2173 > α = 0.05) (Table 6).

Table 6. Paired Comparison of Mean Improvement on V + N Collocation Subtypes in Test 3

Subtypes Compared	Mean Difference %	T-Value	P-Value
Literal vs. Non-literal	0.08	2.66	0.0101< α = 0.05
Literal vs. Non-literal delexicalised	0.526	2.03	0.0469 < α = 0.05
Literal vs. Non-literal Non-delexicalised	0.807	2.79	0.0072 < α = 0.05
Non-literal delexicalised vs. Non-literal non-delexicallised	0.28	1.25	0.2173 > α = 0.05

DISCUSSION

The results of the study indicated that the combination of perceptual salience, metalinguistic knowledge, and a metalinguistic knowledge-based classification activity worked more effectively as input enhancement than perceptual salience alone and the combination of perceptual salience and metalinguistic knowledge.

The first pair of research questions concern the effect of perceptual salience on drawing the participants' attention to the target V + N collocations. The results of Test 1 showed that the highlighted V + N collocations succeeded in making the target collocations noticeable to the participants and drawing the participants' attention to the V + N collocations to a certain extent. But without an explicit understanding of the nature of the target language items and a conscious awareness of the form-meaning relation patterns of the V + N collocations, the participants seemed to have difficulty storing those items in memory and turning a high percentage of what was noticed into intake.

The second pair of research questions involve the effect of metalinguistic knowledge on directing the participants' attention to the target V + N collocations. The significant improvement of the results of Test 2 provided evidence for the participants' awareness of the similarity and differences between the target V + N collocations and their L1 counterparts. In terms of the two subtypes of V + N collocations, the participants gained more improvement on both literal and non-literal V + N collocations.

But the results of the paired comparison of the mean improvements of the subtypes in Test 2 yielded an unexpected finding. The participants made least improvement on the non-literal delexicalised collocations, on which the participants performed best in Test 1.

A possible explanation for this phenomenon can be related to the nature of this subtype of V + N collocations. They are more phrase-like in form and salient to the participants. So many of this subtype of V + N collocations could have been stored in memory to a certain extent. There is little room for their

further improvement.

The third pair of research questions are related to the effect of the metalinguistic knowledge-based classification activity on facilitating the participants' attention to the target V + N collocations. The significant improvement of the results of Test 3 reflected the power of the classification activity. In general, the participants showed significant overall improvement in retrieving the target collocations.

But in terms of the two subtypes of V + N collocations, the participants received significant improvement only on the literal V + N collocations. The non-literal V + N collocations did not improve to an extent that is statistically significant. An explanation for this phenomenon is that the participants, whose English proficiency was that of a lower-intermediate one, were at a stage when positive transfer was still exerting a great influence on the participants' interlanguage system.

Finally, the paired comparison of the mean improvements in Test 3 revealed again the similar phenomenon found in Test 2: the non-literal delexicalised collocations made the least increase in the mean number correct. An explanation for this phenomenon is that the non-literal delexicalised collocations, being more phrase-like in form and thus more noticeable, had been acquired to such an extent at the onset of the study that there was not much room for its further improvement.

CONTRIBUTIONS

Theoretically, this study lends support to the strong version of the Noticing Hypothesis. It helps us increase our knowledge of the form-meaning relation patterns of the V + N collocations and our understanding of how perceptual salience, metalinguistic knowledge, and a classification activity can interact to facilitate learners' identifying, retaining, and learning English V + N collocations.

Practically, this study highlights the importance of the teacher helping learners increase the size of their mental collocations by designing teaching techniques and materials that may effectively draw learners' attention to various types and subtypes of V + N collocations in the input.

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Appendix 1
Test 1: Verb + Noun Collocations

1. She is constantly changing the way she **d _____ her hair** and the clothes she wears.
2. I **c_____ my breath** when I opened the door and found him towering over me.
3. Although he **k_____ late hours,** Roger Mifflin was a prompt riser.
4. She had **l_____ her appetite** and her energy but not her will to live.
5. He **m_____ enemies** with everyone he came across.
6. He shows regular people a few ways to **e_____ an income** online.
7. They will **h_____ a realization** of their own individuality, which includes a growing awareness of self **.**
8. Seizing this opportunity of a lifetime, the two men kept on photographing the angry grizzly as he **c_____ the distance** between them with amazing speed.
9. More than one in five people attempted to **g_____ a suntan** last summer.
10. She put her hand over her mouth to **h_____ her smile.**
11. He **t_____ pains** to excel as a pianist.
12. Scott Mcnealy, president and chair of Sun Microsystems believes that "to give a worker a personal computer is to **i_____ trouble**," calling a floppy disk nothing more than "a way to steal company secrets."
13. As she **c_____ the table** the headline of the Evening Standard caught her eye: ENGLAND MUST WIN.
14. The instructor is required to administer and **m_____ the exam** in person.
15. She told me about an experience that

h_____ an impact on her life.

16. Some poor countries have achieved rapid progress, and have **n_____ the gap** with the rich countries, at least to some extent.
17. The group then moved to another room where Deb **g_____ a demonstration** of a videoconference.
18. In business, sports or everyday relations, always allow your opponent to **s_____ face.**
19. We are **r_____ money** for charity.
20. I opened the package just to **s_____ my curiosity**.
21. It wasn't until the 17th century when Queen Anne **t_____ a fancy** to the hot springs that Bath once again began to grow.
22. He never **s_____ gossip**, and he never even shared the truth about someone if he felt it would be a bad report of that person.
23. I believe the purpose of our existence is to **s_____ happiness.**
24. Another group of some 40 religious Jews climbed the Temple Mount today, but a group of Moslems **c_____ a disturbance** and in the end, the holy site was closed to Jewish visitors earlier than planned.

Appendix 2
Test 2: Verb + Noun Collocations

1. I **m_____ my farewell** to him and walked away.
2. They **m_____ donations** to charity without making a claim for a deduction in their income tax return.
3. Soldiers, I expect you to **d_____ your duty** to the best of your ability.
4. My digital clock **g_____ a few minutes** a week.
5. I enjoy steam locomotives and **c_____ information** about them.
6. How do you go about **r_____ a contest** on your web site effectively?
7. The single **h_____ the charts** at No. 4, confirming the band's hugely deserved popularity.
8. As a student he was remarkable for his intellectual abilities and **h_____ his class**
9. Can anyone **g_____ a guess** as to what this is?
10. Security training won't **t_____ effect** until Microsoft has been restarted.
11. Very few studies have focused specifically on how long students need to **a_____ English proficiency.**
12. He will continue to **e_____ a good reputation** and stay quite popular.
13. Production **r_____ a peak** in 1986 and is now declining.
14. They identified areas where we **l_____ experience** or training and made sure we got it.
15. They **e_____ looks** as though something was wrong.
16. Pets should never **t_____ priority** over children.
17. They are going to **d_____ a study** to find out why there are so many suicides of service men and women in Iraq?
18. The weary traveler was trying to find a spot where he can **c_____ a nap.**
19. This is the worst Chinese restaurant I have ever **h_____ the misfortune** to visit.
20. I **h_____ a lecture** last week. I learned that fear and stress occur, because there is a gap between our expectations and reality.
21. Jesus **h_____ a heart** to save the lost.
22. She **b_____ her head** in her

lap and sobbed.

23. I hope you may **a_____ a college** that will suit your personality and develop your talents.
24. You must learn to **c_____ your desire** for food and eat less.

Appendix 3
Test 3: Verb + Noun Collocations

1. The police chief **m**_____ **no comment** about the bomb attack.
2. **E_____ the contest** today and you could be the lucky winner!
3. Before the shooting, the five teenagers **h_____ a confrontation** with other men at Ashley Park, who they said had thrown rocks at their cars.
4. He **g_____ a cough** to clear his throat and then started to talk.
5. Please ask the recommender to **f_____ the letter** to you in a sealed envelope.
6. Use what you already know and the details of the story to **d_____ a conclusion.**
7. Many people **t_____ a flight** to Thailand to enjoy the sun, sea and sand of the mainland coast and islands.
8. It's time for you to **f_____ your future** and stop living in the past.
9. According to the report, big-city students **m_____ gains** in math and science.
10. Lightening forced officials to **c_____ the game** after 74 minutes.
11. I shoot the ball to the right side-net unhesitatingly and **g_____ a goal**!
12. University of Louisville will **b_____ ground** Thursday on a high-tech research building.
13. Efforts are being made to **h_____ the growth** of plants in the garden.
14. Do your parents **t_____ an interest** in your work?
15. I just **g_____ word** that Panasonic is considering hiring me as a full-time developer.
16. Some bosses say that workers **f_____ illness** to take sick leave.
17. She was less than two years old when she **l_____ her sight** due to a childhood illness.
18. You should **g_____ the opportunity** to tell her how much you care about her.
19. When the bus arrives at the hotel, a guide is standing by ready to **r_____ the guests.**
20. The students will **p_____ a play** based on an African folktale.
21. They will **d_____ the newspaper** to your doorstep.
22. "I am very proud you **r_____ your life** for our country.
23. Let's **d_____ a toast** to old times.
24. I **h_____ a fear** of living on my own because I would get so bored!

Appendix 4
Classification of V + N Collocations in Test 1

Literal Collocations
6.He shows regular people a few ways to **e_____ an income** online.
10. She put her hand over her mouth to **h_____ her smile.**
14. The instructor is required to administer and **m_____ the exam** in person.
18. In business, sports or everyday relations, always allow your opponent to **s_____ face.**
20. I opened the package just to **s_____ my curiosity**.
22. He never **s_____ gossip**, and he never even shared the truth about someone if he felt it would be a bad report of that person.
23. I believe the purpose of our existence is

to **s_____ happiness.**
24. Another group of some 40 religious Jews climbed the Temple Mount today, but a group of Moslems **c_____ a disturbance** and in the end, the holy site was closed to Jewish visitors earlier than planned.

Non-literal Collocations	
Collocations Containing Delexicalised Verbs	**Collocations Containing Non-delexicalised Verbs**
1. She is constantly changing the way she **d _____ her hair** and the clothes she wears.	2. I **c_____ my breath** when I opened the door and found him towering over me.
3. Although he **k_____ late hours,** Roger Mifflin was a prompt riser.	4. She had **l_____ her appetite** and her energy but not her will to live.
5. He **m_____ enemies** with everyone he came across.	8. Seizing this opportunity of a lifetime, the two men kept on photographing the angry grizzly as he **c_____ the distance** between them with amazing speed.
7. They will **h_____ a realization** of their own individuality, which includes a growing awareness of self**.**	12. Scott Mcnealy, president and chair of Sun Microsystems believes that "to give a worker a personal computer is to **i_____ trouble**," calling a floppy disk nothing more than "a way to steal company secrets."
9. More than one in five people attempted to	13. As she **c_____ the table** the
11. He **t_____ pains** to excel as a pianist.	16. Some poor countries have achieved rapid progress, and have **n_____ the gap** with the rich countries, at least to some extent.
15. She told me about an experience that **h_____ an impact** on her life.	17. The group then moved to another room where Deb **g_____ a demonstration** of a videoconference.
21. It wasn't until the 17th century when Queen Anne **t_____ a fancy** to the hot springs that Bath once again began to grow.	19. We are **r_____ money** for charity.

Appendix 5
Classification of V + N Collocations in Test 2

Literal Collocations
5. I enjoy steam locomotives and **c_____ information** about them.
12. He will continue to **e_____ a good reputation** and stay quite popular.
13. Production **r_____ a peak** in 1986 and is now declining.
14. They identified areas where we **l_____ experience** or training and made sure we got it.
15. They **e_____ looks** as though something was wrong.
20. I **h_____ a lecture** last week. I learned that fear and stress occur, because there is a gap between our expectations and

reality.
23. I hope you may **a_____ a college** that will suit your personality and develop your talents.
24. You must learn to **c_____ your desire** for food and eat less.

Non-literal Collocations	
Collocations Containing Delexicalised Verbs	**Collocations Containing Non-delexicalised Verbs**
1. I **m_____ my farewell** to him and walked away.	4. My digital clock **g_____ a few minutes** a week.
2. They **m_____ donations** to charity without making a claim for a deduction in their income tax return.	6. How do you go about **r_____ a contest** on your web site effectively?
3. Soldiers, I expect you to **d_____ your duty** to the best of your ability.	7. The single **h_____ the charts** at No. 4, confirming the band's hugely deserved popularity.
10. Security training won't **t_____ effect** until Microsoft has been restarted.	8. As a student he was remarkable for his intellectual abilities and **h_____ his class.**
16. Pets should never **t_____ priority** over children.	9. Can anyone **g_____ a guess** as to what this is?
17. They are going to **d_____ a study** to find out why there are so many suicides of service men and women in Iraq?	11. Very few studies have focused specifically on how long students need to **a_____ English proficiency.**
19. This is the worst Chinese restaurant I have ever **h_____ the misfortune** to visit.	18. The weary traveler was trying to find a spot where he can **c_____ a nap.**
21. Jesus **h_____ a heart** to save the lost.	22. She **b_____ her head** in her lap and sobbed.

Appendix 6
Classification of V + N Collocations in Test 3

Literal Collocations	
8. It's time for you to **f_____ your future** and stop living in the past.	
12. University of Louisville will **b_____ ground** Thursday on a high-tech research building.	
13. Efforts are being made to **h_____ the growth** of plants in the garden.	
16. Some bosses say that workers **f_____ illness** to take sick leave.	
17. She was less than two years old when she **l_____ her sight** due to a childhood illness.	
18. You should **g_____ the opportunity** to tell her how much you care about her.	
21. They will **d_____ the newspaper** to your doorstep.	
22. "I am very proud you **r_____ your life** for our country.	

Non-literal Collocations	
Collocations Containing Delexicalised Verbs	**Collocations Containing Non-delexicalised Verbs**
1. The police chief **m_____ no comment** about the bomb attack.	2. **E_____ the contest** today and you could be the lucky winner!
3. Before the shooting, the five teenagers **h_____ a confrontation** with other men at Ashley Park, who they said had thrown rocks at their cars.	4. He **g_____ a cough** to clear his throat and then started to talk.
7. Many people **t_____ a flight** to Thailand to enjoy the sun, sea and sand of the mainland coast and islands.	5. Please ask the recommender to **f_____ the letter** to you in a sealed envelope.
9. According to the report, big-city students **m_____ gains** in math and science.	6. Use what you already know and the details of the story to **d_____ a conclusion.**
11. I shoot the ball to the right side-net unhesitatingly and	10. Lightening forced officials to **c_____ the**

g_____ a goal!	**game** after 74 minutes.
14. Do your parents **t_____ an interest** in your work?	19. When the bus arrives at the hotel, a guide is standing by ready to **r_____ __ the guests.**
15. I just **g_____ word** that Panasonic is considering hiring me as a full-time developer.	20. The students will **p_____ ____ a play** based on an African folktale.
24. I **h_____ a fear** of living on my own because I would get so bored!	23. Let's **d_____ _ a toast** to old times.