

# VIETNAMESE EFL COLLEGE STUDENTS' SENSITIVITY TO THE ENGLISH MASS-COUNT DISTINCTION

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**Abstract:** This paper examines how Vietnamese learners of L2 English interpret the English mass-count distinction. In a picture-based judgment experiment, sixty-two college students learning English as their L2 made judgments that reflect their sensitivity to the English mass-count distinction and morphosyntax-semantics mappings. The findings indicate that Vietnamese learners of L2 English correctly based their judgments on number for count nouns (e.g., *cup*) and object-mass nouns (e.g., *furniture*), and on volume for substance-mass nouns (e.g., *milk*). In addition, Vietnamese learners performed at chance level with English flexible nouns, i.e., nouns that are interpreted as count in the presence of the plural marker *-s* and as mass in its absence. Furthermore, no significant correlation was found between learners' L2 proficiency scores and their judgments. Taken together, these findings suggest that Vietnamese college students are insensitive to the morphosyntactic cues of English flexible nouns when interpreting their meaning. Such insensitivity might be due to L1 effects and can be independent of L2 proficiency.

**Keywords:** mass-count distinction, morphosyntax-semantics mapping, Vietnamese, quantity judgment, L2 acquisition

## 1. Introduction

Recent research on second language acquisition (SLA) has seen a growing interest in understanding the interfaces between the linguistic system and different grammar modules of the second language (L2) learner, such as syntax-semantics, syntax-morphology or morphology-phonology. In particular, there has been considerable emphasis on exploring L2 learners' ability to correctly map morphosyntactic elements onto their corresponding semantic interpretations, especially when the learner's first language (L1) is devoid of such mapping. To date, the majority of L2 research on the morphosyntax-semantic interface is primarily done in the aspectual domain (i.e., the acquisition of tense-aspect system, cf. Montrul & Slabakova, 2002).

As far as nominal domain is concerned, focus has mostly been directed to the L2 acquisition of article semantics and plural markings on noun phrases in different semantic contexts. For instance, L2 learners of English whose L1 lacks an article system are found to frequently map the English articles (*a/an*, *the*,  $\emptyset$  or the null article) to incorrect semantic features (Ionin et al., 2004; Nguyen, 2017; Nguyen, 2018). Another topic of great concern in this domain is the relationship between morphosyntactic marking plural *-s* and semantic interpretation involved in the English mass-count distinction and how L2 learners interpret such relationships. In this area, an interesting question could be raised as to whether L2 learners of English whose L1 is devoid of the plural marking *-s* can encode the English mass-count contrast on the basis of morphosyntactic knowledge.

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Nevertheless, studies exploring L2 knowledge of morphosyntax-semantics mapping in the mass-count distinction are, unfortunately, quite rare. One of the earliest attempts to answer the question raised above is Inagaki (2014) whose goal was to test L1 Japanese-L2 English adult learners' sensitivity to the syntax-semantics mapping for the mass-count distinction. Yin and O'Brien (2018) is another recent study that examined the morphosyntax-semantics mapping with Chinese-English bilingual adolescents. Both of the aforementioned studies involve participants whose L1s lack a mass-count distinction and the corresponding obligatory number marking (Cheng & Sybesma, 1999; Muromatsu, 2003) and L2 English proficiency level are quite advanced. None of these studies deal with L2 speakers whose level of English proficiency is intermediate or lower-intermediate.

The present study is motivated by two reasons. Firstly, there is a lack of similar research into how Vietnamese learners of English can encode the target-like mass-count distinction based on plural marking *-s* when Vietnamese is devoid of the parallel mapping. Secondly, little is known about whether L2 proficiency contributes to the variability in L2 learners' sensitivity to morphosyntax-semantics mapping. The present study is thus expected to contribute more empirical data to the existing SLA literature regarding this nominal domain.

## 2. Literature Review

The mass-count distinction is traditionally assumed to be largely based on their respective ontological features in which homogeneous substance is generally denoted by mass nouns (e.g., *water*) whereas discrete and individuated objects are represented by count nouns (e.g., *dog*). There are a number of ways in which a language can encode this distinction in its morphosyntax. English, for example, allows pluralization via plural marker *-s* for count nouns (e.g., *dogs*) but not for mass nouns (e.g., *\*waters*). In addition, English mass nouns and bare plural nouns can be used to denote kinds (e.g., *I like water and I like dogs*), in contrast to bare singular count nouns which cannot denote kinds (e.g., *\*I like dog*). Furthermore, English

count and mass nouns co-occur with different types of determiners (e.g., quantifiers such as *many/few* and numerals are permitted for count nouns while only quantifiers such as *much/little* can be used for mass nouns).

Vietnamese, on the other hand, differs from English in a number of respects. To begin with, Vietnamese does not explicitly mark the mass-count distinction with a plural morpheme as seen in English, and head nouns in Vietnamese are generally treated as mass nouns (Chierchia, 1998). In addition, Vietnamese has a generalized classifier system in which a noun must always be preceded by a classifier before it can be quantified (the syntactic order being numeral + classifier + noun). Classifiers are required to enable counting for all nouns and the lack thereof would automatically result in ill-formedness, as illustrated in (1) below:

- (1) Ba trái táo Vietnamese  
 Three CL apple  
 'Three apples' English  
 \*Ba táo Vietnamese  
 Three apple  
 'Three apples' English

Nevertheless, a difference exists in the type of classifiers that can go with mass nouns and count nouns such that count classifiers serve to name partitioning units for nouns, while mass classifiers create such units. Hence, Vietnamese seems to encode the mass-count distinction through its classifier system in contrast with English where it is morphologically reflected. The difference between Vietnamese and English regarding morphosyntax-semantic mapping for the mass-count distinction might present considerable challenges to Vietnamese L2 learners of English.

In addition, we need to mention the fact that while it might be tempting to think the mass-count distinction is a mere syntactic coding of the object/substance difference, there is in fact a lack of a clear reduction of count and mass nouns into representations of objects and substances. Mass nouns like *jewelry* or *furniture* are used to refer to (collections of) individuals, as opposed to substance (Bale & Barner, 2009; Chierchia, 1998). Count nouns such as *line* or *twig* are used to talk about homogenous entities in the sense

that any arbitrary subpart of a twig is a twig, just as an arbitrary subpart of water is water. These instances further blur the semantic distinction between count and mass. Indeed, the entities that can be described with a plural count noun (e.g., *shoes, coins, ropes*) can also be described with a mass noun (e.g., *footwear, change, rope*), again demonstrating that the grammatical mass-count distinction does not align neatly with the ontological object-substance distinction. A question naturally arises, which is whether we can arrive at a unified semantic representation from which we construct the meanings of both count and mass nouns. The answer to this question proves crucial in any attempt to understand how language learners, children and L2 learners alike, acquire the mass-count distinction and its encoding in a language.

### 2.1. Theories of Mass-Count Distinction

In early semantic work such as Quine (1960), count and mass nouns are distinguished on the basis of individuation and cumulativeness. Specifically, Quine noted that while count nouns provide the logical structure required for individuating entities and tracing their identity through space and time, mass nouns fail to provide principles of individuation. Adopting a similar view, Link (1983) argued that only count nouns refer to individuals or 'atoms', and Wisniewski et al. (1996, p. 271) believe language users should 'conceptualize the referents of count nouns as distinct, countable, individuated things and those of mass as non-distinct, uncountable, unindividuated things'. We can summarize the Quinian theory of mass-count distinction in (2) below:

- (2) a. count noun → individual  
b. mass noun → non-individual

In addition, Quine noted that mass nouns have the property of cumulative reference. For example, given a mass noun such as *water*, it is true that 'if a is water and b is water then a and b taken together are water'. Given a count noun such as *dog*, however, it does not follow that 'if a is a dog and b is a dog then a and b taken together are a dog'. It follows from this analysis that a mass noun is cumulative, while a count noun is non-cumulative. In a similar spirit, Cheng (1973) argued that the meaning of words like *water* are crucially distinct from words like

*dog* in another aspect which is coined divisivity. For example, if c is water and a and b are two parts that make up c then a is water and b is water. On the other hand, if c is a dog and a and b are parts that make up c, it does not follow that a is a dog and b is a dog.

Using Boolean algebras, Link (1983) proposed a formal account of the above conceptual properties of the mass-count distinction. In this analysis, nouns like *dog* denote a set of atoms (objects without subparts) while nouns like *water* denote a set that is closed, both upwardly and downwardly, under the 'part-of' relation (i.e., if the elements a and b are members of the denotation, then any element c that is part of a or b is a member of the denotation; and any element c that is the combination of a and b is also a member of the denotation). These general properties are said to hold true whether the count or mass nouns are abstract or concrete. Singular count nouns always denote a set of atoms while mass nouns have denotations that are divisive and cumulative and hence do not contain atoms.

Some challenges have been raised to this Quinian analysis of mass-count distinction based on cumulativeness or divisivity. First of all, this cumulativeness of reference fails to distinguish mass nouns from plural count nouns: 'if the animals in this camp are horses and the animals in that camp are horses then the animals in the two camps are horses' (Gillon, 1996). Secondly, while count nouns uniformly have atomic denotations, mass nouns can vary in which some such as *milk* or *happiness* do not have atoms in their denotation while others such as *equipment* and *furniture* do. Taking a departure from the Quinian analysis, Gillon (1996) proposed that all mass nouns are linguistically unspecified for whether they can be individuated or not. An examination of the world would tell one that *furniture*, despite being linguistically non-specified, denotes individuals while *water* does not. In light of this theory, mass-count flexibility observed with nouns such as *rope* or *string* can also reveal the denotation of mass nouns. A mass noun's "conversion to a count noun requires that its denotation must be such that it has minimal parts, or atoms" (p. 28). Thus, any term that can be used in either mass or count syntax (e.g., *string/strings*) must denote individuals in its mass realization.

## 2.2. The Quantity Judgment Paradigm

Reluctant to defining the mass-count distinction in terms of both syntactic and semantic criteria, Barner and Snedeker (2005) believed that the task of characterizing the mass-count distinction can be made possible by looking at quantity judgment data. They observe that in some languages that have a syntactic mass-count distinction such as English, some mass nouns can have countable atomic denotations. Mass nouns such as furniture and equipment permit quantity judgments based on number in comparative sentences whereas nouns such as water and mud do not. For instance, speakers of English judge sentences in (3a) and (3b) based on the numbers of items possessed by each person. Even if John only has three small chairs, four small side tables and a small couch whereas Mary has two giant chairs and a huge couch that weighs more than all of John's items taken together, John still has more furniture than Mary.

- (3) a. John has more furniture than Mary.  
b. John has more chairs than Mary.

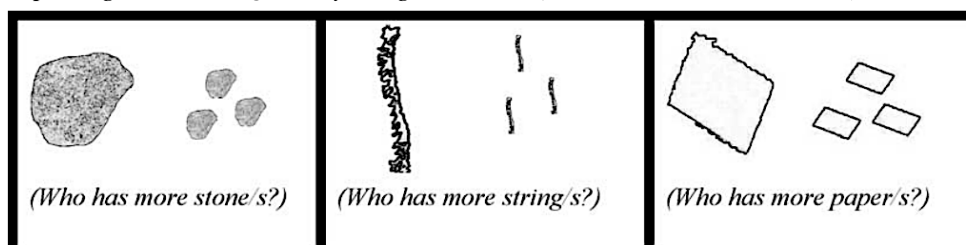
- c. John has more mud than Mary.

In contrast, nouns with non-atomic denotations such as mud in (3c) never permit comparison by number, even when suitable portions for counting are given and illustrated. If John has five small buckets of mud while Mary has one huge bucket, Mary is judged to have more mud as long as her bucket contains a greater mass or volume of mud, despite the fact that John has a greater number of portions.

Bale and Barner (2009) argued for a methodology which they often deployed in their experiments to test the semantic interpretation of mass and count nouns relying on quantity judgments as shown in Figure 1 below (cf. Barner & Snedeker, 2005; Barner et al., 2008). This method has helped to establish a number of interesting patterns underlying object-mass nouns and the mass-count shifting (i.e., mass nouns that permit individuation depending on contexts, e.g., *string/a string/strings*, *stone/a stone/stones*).

**Figure 1**

*Images Depicting Stimuli in Quantity Judgment Task (Barner & Snedeker, 2005)*



Specifically, the same noun in the same context yields different methods of comparison when used as a mass noun versus a count noun. Consider the examples in (4) and (5) taken from Bale and Barner (2009).

- (4) a. Esme has more ropes than Seymour.  
b. Esme has more strings than Seymour.  
c. Esme has more stones than Seymour.  
(5) a. Esme has more rope than Seymour.  
b. Esme has more string than Seymour.  
c. Esme has more stone than Seymour.

Evaluating the truth or falsity of the sentences in (4) requires counting the number of ropes, strings, and stones, while doing so in (5) requires comparing the length, mass, volume or

area associated with the rope, string, or stone. In one and the same context, sentences in (4) could be true while the ones in (5) could be false.

This quantity judgment task has been used in a growing number of studies to address the empirical challenge of defining and interpreting the mass-count distinction. As empirical inquiry expands, a number of studies have extended this task paradigm to exploring the nature of mass-count distinction in a number of languages other than English, and a few among which have attempted this method to examine the L2 acquisition of mass-count distinction in some learner populations. The following section offers a dissemination of such studies.

### 2.3. Mass-Count Knowledge in Second Language Acquisition

Research into L2 acquisition of mass-count distinction is much less diverse compared to L2 acquisition of other nominal knowledge. There are broadly two lines of research in this area: one is to look at the morphosyntax-semantics mapping in relation to the mass-count distinction, and the other is to examine L2 learners' sensitivity to the morphosyntactic properties of count versus mass nouns such as the plural morpheme *-s* and quantifiers. Given the scope and objectives of this study, this section focuses on reviewing the first one only.

Inagaki (2014), adopting the quantity judgment paradigm mentioned above, tested L1 Japanese-L2 English adult learners' sensitivity to the syntax-semantics mapping for the mass-count distinction. In their stimuli, the volume and number of objects/portions of substance were manipulated and participants were to judge which side has more objects/substance, assuming the quantity for count nouns depends on number and for mass nouns on volume. Interestingly, one of the test conditions contains nouns that could alternate between count (in plural form) and mass (in singular form) contexts, namely *Which side has more strings/string?* The results indicated that L2 learners' judgment of quantity did not depend on mass-count syntax, namely whether the flexible nouns are used with plural marking *-s* or without, and they performed worse in count conditions than in mass conditions. It was concluded that the participants had issues with morphosyntax-semantics mapping for the mass-count distinction. What remains unclear in Inagaki (2014) is whether learners' difficulty with morphosyntax-semantics mapping would persist even when they become increasingly proficient at the target language.

Adopting a similar design, Yin and O'Brien (2018) carried out an experiment with 228 Chinese-English bilingual students aged primary and secondary schools in Singapore). Their stimuli contained five noun conditions including object-count (e.g., *shoe*), substance-mass (e.g., *ketchup*), object-mass (e.g., *furniture*) and two conditions involving items

that can occur flexibly in both mass and count contexts (e.g., *string/strings*). Analyses of the subjects' quantity judgments across conditions reveal that Chinese-English bilingual children were able to use morphosyntactic knowledge to cue meanings, providing number-based judgments for count conditions and volume-based judgments for mass conditions just as native English speakers would do. Interestingly, the results revealed a developmental effect where younger participants were less accurate in assigning volume-based judgments to substance-mass conditions compared to older bilinguals. Nevertheless, regarding performance in flexible noun conditions, both Chinese- and English-dominant bilinguals did not reach the level of adult native speakers reported in Barner and Snedeker (2005). In particular, around 65% and 40% of their judgments are number-based for nouns appearing in count and mass syntax respectively, as opposed to 95% and 3% of native speakers' judgments. This finding suggests that child bilinguals have yet to use syntax to guide their judgments, thereby showing their insensitivity to morphosyntax-semantics mappings in the mass-count distinction.

MacDonald and Carroll (2018) took another attempt to deal with the English mass-count distinction, exploring the L2 processing of English mass-count nouns by L1 Koreans. Adopting the same quantity judgment paradigm, they found that Korean learners of L2 English paid attention to morpho-syntactic cues to the mass-count contrast when processing English object-count nouns, substance-mass nouns and object-mass nouns. However, Korean learners deviated from English native speakers on the flexible noun conditions where the plural morphology was the critical cue to the correct interpretation, indicating that Korean learners of English experience difficulty with English flexible nouns. This finding is explained with recourse to the learners' L1 in which there is a strong positive correlation between the English flexible nouns and the corresponding morphologically unmarked nouns in Korean (e.g., those that are not marked with the usual Korean plural marker *-tul*), suggesting a role for lexical transfer in the delayed acquisition of English mass-count contrast.

To summarize, previous studies seem to show inconclusive results regarding proficiency effects. In addition, there seems to be a lack of consistency as to what sources of difficulty with the mass-count distinction that L2 learners have. While results from Inagaki (2014) indicate that count nouns induce poorer performance, MacDonald and Carroll (2018) and Yin and O'Brien (2018) suggest that flexible nouns pose greater difficulty for L2 learners. To address this gap, the present study focuses on examining L1-Vietnamese L2-English learners' knowledge of the morphosyntax-semantics mapping in relation to the English mass-count distinction and investigating the role of proficiency in the acquisition of English mass-count contrast, as well as trying to establish the sources of difficulty with the mass-count distinction. Following previous research, we adopt the quantity judgment paradigm to investigate this knowledge. In light of the findings obtained from prior studies, the following predictions are made. Firstly, L1-Vietnamese L2-English learners would not have problems giving accurate judgments on conditions where morphosyntax and conceptual semantics are congruent (where the ontological object-substance distinction aligns with the

morphosyntax). On the contrary, difficulty might arise in situations where learners can only rely on conceptual semantics to make judgment and that conceptual semantic knowledge proves to be rather idiosyncratic (object-mass nouns such as *furniture*). In addition, L2 learners are predicted to make inaccurate judgments in conditions where attention to morphosyntax is required (flexible nouns such as *stone/stones*). Lastly, concerning the proficiency effect, we predict that participants with higher English proficiency might perform better in these contexts.

### 3. The Present Study

#### 3.1. Participants

Participants were 62 Vietnamese college students whose age ranged from 18 to 25 years old (mean age = 21), and they were selected randomly from a university in Ho Chi Minh City, Vietnam. They were enrolled in different academic disciplines (e.g., English linguistics, Economics to Information Technology). The participants were placed into two different English proficiency levels based on their scores in the Quick Placement Test (2001; version 2). The description of the participants is summarized in Table 1.

**Table 1**

*Participant Information*

Group	Number of subjects	Mean scores (out of 60) and SD	Mean age
Low Intermediate Group (LI)	29	35.27 (SD = 2.23)	20.8
High Intermediate (HI)	33	45.48 (SD = 1.60)	21.2
Total	62		

#### 3.2. Materials

The participants in this study completed two tasks: a quantity judgment test and a test of English proficiency – the Oxford Quick Placement test.

##### *Oxford Quick Placement test (QPT)*

The QPT test contains 60 multiple-choice questions measuring L2 learners'

reading, vocabulary and grammar competence and to be completed within 40 minutes. The QPT test places its test takers at five proficiency levels that correspond to the Association of Language Testers in Europe (ALTE) levels and the Common European Framework of Reference for Languages (CEFR) levels. Table 2 describes the QPT levels and compares them with ALTE levels and CEFR levels.

**Table 2**

*Details of QPT, ALTE, and CEFR Levels*

QPT scores	QPT levels	ALTE levels	CEFR levels
55-60	Very advanced	Level 5	C2
48-54	Advanced	Level 4	C1
40-47	Upper intermediate	Level 3	B2
30-39	Lower Intermediate	Level 2	B1
18-29	Elementary	Level 1	A2
0-17	Beginner	Level 0	A1

Given the fact that we conducted this research in time of COVID-19 pandemic and large-scale social distancing, the original paper-based QPT was administered over the Internet. We first digitized the test using Google Forms and then distributed the form to the participants through email. The participants' test scores were then subject to a reliability test, which yielded the value of Cronbach's alpha of 0.92, suggesting the reliability of this proficiency test used for this study.

*Quantity Judgment Test*

As mentioned earlier, we employed the quantity judgment paradigm pioneered by Barner and Snedeker (2005) to investigate Vietnamese college EFL students' knowledge of mass-count distinction. In this study, we are interested in five noun conditions, namely object-count nouns, substance-mass nouns, object-mass nouns, flexible nouns in count syntax, and flexible nouns in mass syntax. These conditions constitute three mapping relationships, which are congruent mapping where ontological semantics and morphosyntax are aligned, incongruent mapping where morphosyntax and ontological semantics are not aligned and flexible mapping where nouns can occur in two morphosyntactic contexts. With

respect to congruent mapping, there is agreement among conceptual semantics, morphosyntax and semantic judgment. There are two types of nouns in this group, which are substance-mass nouns and object count nouns. Regarding substance-mass nouns, they are always in singular form and semantic judgment is always volume-based. On the contrary, object count nouns can be pluralized, and semantic judgment is always number-based. Regarding incongruent mapping, the agreement only appears between conceptual semantics and semantic judgment. It means that the nouns in this group are grammatically mass but can be denoted individuals and made quantity judgment based on the number of individuals like the typical count nouns in the congruent groups. With regard to flexible mapping, the nouns in this group can appear in both form – singular and plural in which when making quantity judgment, participants needed to pay attention to count syntax and mass syntax as in count form, semantic judgment is based on number and in mass form, semantic judgment is based on volume. The test consists of 40 items, 30 of which are main test items and 10 fillers. The complete list of items is provided in Table 3 below. For the quantity judgment test, we briefly illustrate the sample for each test condition in Figure 2-6 below.

**Table 3**

*Conditions and Items Used in the Study*

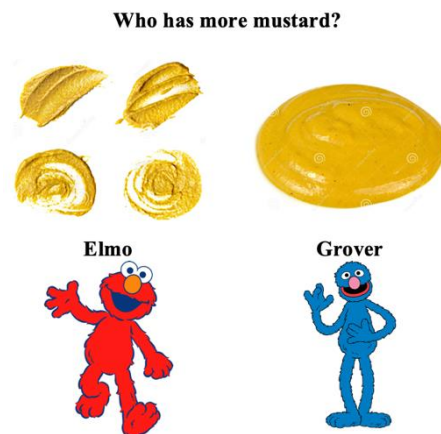
Mapping relationship	Condition	Number of items
Congruent (morphosyntax and conceptual semantics aligned)	Substance-mass <i>mustard; butter; toothpaste; sugar; ketchup; milk</i>	6

	Object-count <i>cups, pens, balls, bags, plates, shoes</i>	6
Incongruent (morphosyntax and conceptual semantics not aligned)	Object-mass <i>furniture; jewelry; equipment; clothing; silverware; mail</i>	6
Flexible (nouns that can appear in both count and mass syntax)	Flexible in count context <i>strings; ropes; rocks; stones; cakes; chocolates</i>	6
	Flexible in mass context <i>twig; fence; paper; pie; wire; salad</i>	6
Fillers	<i>dogs, tigers, flour, sauce, trucks, oranges, popcorn, tables, mugs, vases</i>	10
<b>Total</b>		<b>40</b>

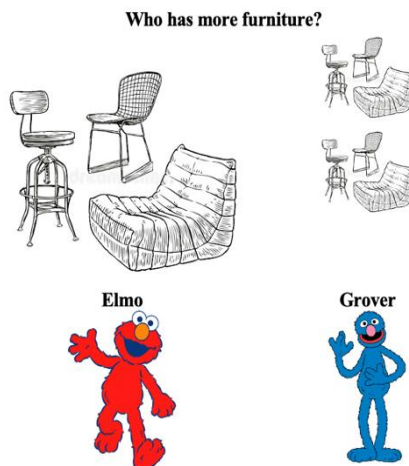
**Figure 2**  
*Sample for Object Count Nouns*



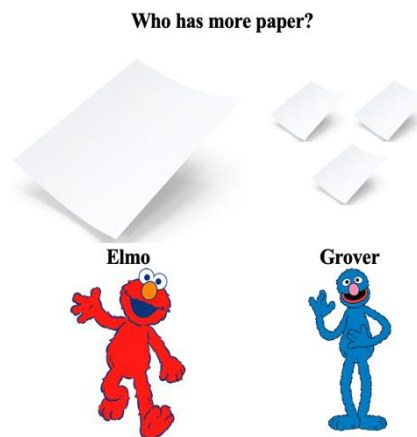
**Figure 4**  
*Sample for Substance-Mass Nouns*



**Figure 3**  
*Sample for Object Mass Nouns*

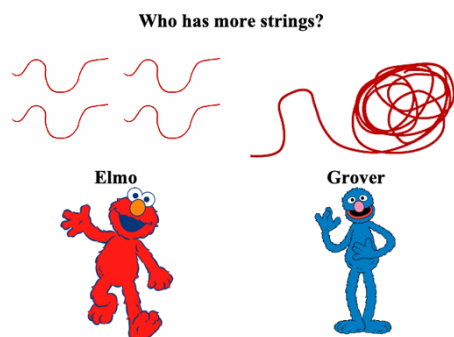


**Figure 5**  
*Sample for Flexible Nouns in Mass Contexts*





**Figure 6**  
*Sample for Flexible Nouns in Mass Contexts*



The quantity judgment test is available in two versions to heighten the random probability and prevent participants from guessing the pattern. Both equivalent versions comprise 40 test items. The items were chosen based on their frequency and no repetition appeared. Additionally, to make this study distinguished we pay attention to the flexible nouns in which if the word is with plural marking (-s) in version 1 then it is without -s in version 2 and vice versa. The order of questions is manually scrambled and the question order in the final versions is fixed for all participants. Individual responses to individual questions are recorded in the database, enabling later analysis of responses.

**3.3. Procedures**

The participants completed two tasks - the quantity judgment test and the proficiency

test, both of which were built on Google Form and distributed to the L2 learners via emails. At the beginning of the first task, participants were asked to give some background information including names and ages. Subsequently, a brief instruction and 05 practice items of the quantity judgment test were given so as to familiarize the participants with the test. This test had two versions which were delivered randomly to participants. In each version, there were 24 items presented in random order. Participants were shown questions “Who has more NP(s)?” first and then pictures of two characters from Sesame Street: Elmo and Grover. One character had 1-2 large object(s) or one large drop or smear of substance and the other character had 3-4 tiny objects/substances. In the 15-minute time limit, they indicated their answers by clicking on the appropriate name of the two characters. In the second task, participants were required to complete an Oxford Quick Placement test consisting of 60 multiple-choice questions in 40 minutes to reliably place them in two separate proficiency groups, namely intermediate group (N=29) and advanced group (N=23). All testing was done individually with screen devices.

**4. Results**

Following previous research using the quantity judgment paradigm, responses were analyzed by calculating the rate of number-based judgments, e.g., judging four small cups as more than two large cups or four small drops of milk as more than a large drop of milk. The following table summarizes the results for two proficiency groups.

**Table 4**  
*Percentage of Number-Based Judgments*

	Object-count	Substance-mass	Object-mass	Flexible nouns used with count syntax	Flexible nouns used with mass syntax
Intermediate learners N=29	98.8%	28.6%	93.4%	45.5%	69.6%
Advanced learners N=33	99%	17.2%	92.4%	45.4%	67.1%

In congruent conditions where morphosyntax and conceptual semantics align, lower-proficient and higher-proficient participants' percentage of number-based judgments for object-count nouns account for 98.8% and 99%, respectively, and for substance-mass nouns the rates of number-based judgments are 28.6% for lower-level participants and 17.2% for higher-level participants. In the incongruent condition where morphosyntax and conceptual semantics do not align, judgments from both groups are mostly based on the number of individuals for object-mass nouns, at 93.4% and 92.4% for the lower proficiency group and higher proficiency group respectively. In the flexible conditions where nouns could be used with either count syntax (with the plural marking *-s*) or mass syntax (without the plural marking *-s*), both groups perform at chance level, fluctuating between giving number-based judgments and volume-based judgments regardless of whether the nouns are used with count or mass syntax.

At this stage, we believe it is useful to look at the L2 learners' judgments in terms of accuracy. This is usually done by comparing the results from L2 learners with those of a native speaker control group on the same test. Admittedly, we did not employ a native speaker control group for our study, partly due to logistical constraints; however, since our study made use of the similar quantity judgment paradigm first implemented in the seminal work of Barner and Snedeker (2005), we decided to use their results as benchmark for this study. In their study, 100% of adult native speakers' judgments are based on number for object-count nouns, 98% for object-mass nouns, 0% for substance-mass nouns, 95% for flexible nouns used with count syntax and 3% for flexible nouns used with mass syntax. Therefore, number-based judgments for substance-mass nouns and flexible nouns used with mass syntax given by the participants in our study would be coded as incorrect. Table 5 below reports the accuracy rates of both proficiency groups on five conditions.

**Table 5**  
*Accuracy Rates Across Noun Conditions and Proficiency*

	Object-count	Object-mass	Substance-mass	Flexible nouns used with count syntax	Flexible nouns used with mass syntax
Lower proficiency N=29	98.8%	93.4%	71.4%	45.5%	30.4%
Higher proficiency N=33	99%	92.4%	82.8%	45.4%	32.9%

From the above table, it could be seen that object-count and object-mass nouns are relatively unproblematic for the L2 learners as the vast majority of the judgments are accurate, while flexible nouns pose considerable challenge for the L2 learners as fewer than half of their judgments are non-target-like.

In determining if noun type (i.e., object-count, object-mass, substance-mass, and flexible) and learner proficiency affect learners' judgments, we ran a two-way repeated measures ANOVA with noun type (object-count, substance-mass, object mass, flexible) as a within-subject variable and proficiency level

(lower proficiency and higher proficiency) as a between-subject variable, while judgment accuracy was the dependent variable. The test results reveal a main effect of noun type ( $F(3, 240) = 57.44, p < .001$ ). A large observed effect size was also reported ( $\eta^2 = 0.42$ ). Pairwise comparisons with Bonferroni adjustment show significant differences in accuracy rates between all noun types, except for flexible nouns used with count syntax and mass syntax ( $p = .45$ ). Concerning the proficiency effects, no main effects of language proficiency were found ( $F(1, 240) = 2.28, p = .13$ ). In addition, no significant interaction effects were found between noun type and language proficiency ( $p = .32$ ).

Taken together, these results suggest that L2 learners seem to have little difficulty interpreting object count and object mass nouns as quantifying over individuals and mass nouns as quantifying over overall mass. However, they face considerable challenges where sensitivity to syntactic cues (i.e., the presence or absence of plural marker *-s*) is required to make native-like judgments, even when they are moving up on the proficiency scale. This finding indicates L2 learners' insensitivity to the role of syntax in quantification judgments and suggests incomplete acquisition of the English mass-count distinction even at high levels of L2 proficiency.

## 5. Discussion

In this study, we explored Vietnamese adult L2 learners' knowledge of morphosyntax-semantics mappings in English mass-count distinction and examined whether they are sensitive to the English plural morpheme *-s* as a crucial cue to correctly interpreting flexible nouns. We also looked at proficiency as a potential factor governing the acquisition of English mass-count distinction. We employed a quantity judgment task with two groups of different English proficiency levels, who were 62 Vietnamese college students learning English as their L2. In this task, the learners were asked to make semantic judgments (volume-based or number-based) about the quantity of objects or substance for five noun conditions that constitute three types of mapping relationships between morphosyntax and conceptual semantics: congruent mapping (where count syntax corresponds to conceptual semantic notion of individuation/discreteness and mass syntax corresponds to conceptual semantic notion of homogeneity), incongruent mapping (where mass syntax corresponds to conceptual semantic notion of individuation/discreteness) and flexible mapping (where nouns could be used with both mass syntax and count syntax).

The results reported in Section 4 showed that Vietnamese L2 learners of English correctly based their judgments on number for object-count nouns and object-mass nouns, and on volume for substance-mass nouns, but failed to make native-like judgements when it comes to

flexible nouns that could be used with both mass and count syntax. These results are in line with our predictions stated earlier and also in consensus with what was found with L1 Japanese-L2 English participants in the experiment of Inagaki (2014). As far as the sources of difficulty are concerned, aligned with our predictions, L1 Vietnamese-L2 English learners have great difficulty with flexible nouns, particularly flexible nouns used in mass syntax as indicated by their low rate of target-like judgments. Surprisingly, we found that while the higher proficiency group performed slightly better than the lower proficiency group, the difference between the two groups was not statistically significant, indicating the insignificant role of proficiency in predicting whether the learners can successfully acquire the English mass-count distinction.

The learners are highly successful with congruent mapping conditions, indicating their reliance on conceptual semantics rather than morphosyntactic knowledge. On the other hand, the learners' performance in substance-mass condition and flexible nouns was at chance level, seemingly suggesting their difficulty with conceptual semantics for mass nouns or mass syntax. This result might be attributed to task effects of this quantity judgment paradigm. Nouns used in mass syntax are homogeneous, and thus artificially dividing the substance into portions as how nouns were presented in this study might create additional processing burden for the learners to judge and compare the amount of the substance and thus might lead to low accuracy in their judgments. For instance, the test item *mustard* invited the learner to make comparisons between two large smears of mustard and four smaller smears of mustard. The learners thus had to mentally merge the portions of mustard together on both sides before comparing the volume of the substance. This additional step could have led to the increase in the processing cost, resulting in low accuracy with mass nouns and flexible nouns used in mass syntax.

## 6. Conclusion

Using a quantity judgment test (Barner & Snedeker, 2005), this study was conducted in

order to explore how Vietnamese adult learners of L2 English acquire English mass-count distinction. The findings show that despite lacking mass-count syntax in the Vietnamese language, L2 learners accurately give number-based judgments for nouns denoting individuals, namely object count nouns (e.g., *pen*) and object-mass nouns (e.g., *jewelry*) and give volume-based judgments for substance-mass nouns (e.g., *ketchup*) which denote non-individuals. Furthermore, adult L2 learners' judgments are not significantly correlated with their proficiency levels.

This study has several important pedagogical implications. Firstly, in order to sensitize Vietnamese L2 learners of English to morphosyntactic cues and help them to fully acquire mass-count distinction, they should be exposed to syntax-semantic mappings at early stages of studying English. Additionally, should it be helpful if teachers direct learners' attention to plural marker *-s* for more accurate meaning interpretation and teach them a common set of English flexible nouns.

However, this research does have some limitations. Tested items were limited and did not include cross-linguistic variable nouns (e.g., *hair*). The number of our participants, additionally, were quite small, and they were mainly Vietnamese university students. After analyzing the data, we just compared them with statistics in the previous study (i.e., Barner & Snedeker, 2005). Thus, more tested nouns and larger populations comprising both L1 and L2 learners may be needed to make comparisons and produce more concrete results.

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## KHẢO SÁT ĐỘ NHẠY CẢM CỦA SINH VIÊN HỌC TIẾNG ANH NHƯ MỘT NGOẠI NGỮ ĐỐI VỚI SỰ KHÁC BIỆT VỀ KHỐI-LƯỢNG TRONG TIẾNG ANH

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**Tóm tắt:** Bài báo này kiểm tra cách người Việt Nam học tiếng Anh như một ngoại ngữ diễn giải sự khác biệt về khối-lượng (mass-count distinction) của danh từ tiếng Anh. Trong một thí nghiệm phán đoán dựa trên hình ảnh, 62 sinh viên đại học đã đưa ra những phán đoán phản ánh độ nhạy của họ đối với sự khác biệt khối-lượng trong tiếng Anh và ánh xạ hình thái-ngữ nghĩa. Kết quả chỉ ra rằng những người Việt Nam học tiếng Anh đưa ra các phán đoán chính xác dựa trên số lượng (number-based judgment) đối với danh từ đếm được chỉ vật thể (object-count nouns, ví dụ: *cốc*) và danh từ khối lượng chỉ vật thể (object-mass nouns, ví dụ: *đồ đạc*) và dựa trên khối lượng (volume-based judgment) đối với danh từ khối lượng chỉ chất (substance-mass nouns, ví dụ: *sữa*). Ngoài ra, đối với các danh từ tiếng Anh có thể được diễn giải linh hoạt tùy vào sự xuất hiện/vắng mặt của hình vị số nhiều -s, tức là danh từ được hiểu là có thể đếm được (count nouns) khi có hình vị -s đi kèm và không đếm được (mass nouns) khi không có -s, thì người học chưa đạt được sự nhạy cảm với sự linh hoạt này dựa trên chỉ dấu hình vị số nhiều -s. Hơn nữa, không có mối tương quan đáng kể nào được tìm thấy giữa trình độ tiếng Anh của người học và độ nhạy cảm. Tổng hợp lại, những phát hiện này cho thấy rằng sinh viên đại học Việt Nam chưa có sự nhạy cảm với các dấu hiệu hình thái của danh từ linh hoạt trong tiếng Anh khi cần phải diễn giải ý nghĩa của chúng.

*Từ khóa:* sự phân biệt khối-lượng, ánh xạ hình thái-ngữ nghĩa, phán đoán số lượng, sự tiếp thu ngôn ngữ thứ hai