Investigating Cognitive Individuation:

A Study of Dually-Countable Abstract Nouns

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Investigating Cognitive Individuation:

A Study of Dually-Countable Abstract Nouns

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ABSTRACT

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Investigating Cognitive Individuation: A Study of Dually-Countable Abstract Nouns

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Abstract nouns refer to entities that do not exist in space and time, and are construed in the English language as count nouns (countable entities), mass nouns (non-countable phenomena), or both (i.e., they are dually countable). Drawing from previous research that has investigated the count-mass distinction in concrete nouns, the goal of the present study is to explore the usage of count versus mass status of abstract nouns. In particular, this study evaluates the Cognitive Individuation (CI) Hypothesis, which assumes that countability depends on ease of individuation. Three types of analysis of dually-countable abstract nouns include (1) an account of the ontological status of the nouns’ referents in both count and mass status, (2) corpus analysis of the modification of dually-countable nouns, and (3) the contextual semantic shifts for count and mass versions of the dually-countable nouns. The combined results of these analyses support the view that the CI Hypothesis descriptively applies to abstract nouns to indicate countability, and that individuation can be attributed to modification and shifts in meaning resulting from ontology and polysemy. Finally, this study postulates the perceptual schema behind individuation of third-order nouns and the implications for the cognition of plurality in abstract entities.

Approved:______________________________________________________________

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I am grateful for my mother, my rock, whose creative and quirky use of language sparks my intrigue and inspires my research.
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INTRODUCTION

Since the late 1920s, linguists and other language researchers have written and studied the count-mass noun distinction—that is, that some nouns name things that can be counted, and others name things that are taken as non-countable entities, such as oats (count) and wheat (non-count or mass). Previous studies have proposed syntactic, semantic, and conceptual theories of patterns that explain why one noun is countable and another is mass. The bulk of the research on count-mass nouns focuses on concrete nouns; in contrast, very few studies have been concerned with the count-mass distinction in the class of abstract nouns—those which refer to notions that do not exist as material objects in time and space. Recent theories of the count-mass distinction in concrete nouns propose that perceptual and conceptual individuation of a noun’s referent can provide, at the very least, descriptive evidence for that noun’s status as count or mass. Such studies have examined noun classes including aggregates, superordinates and sights/sounds (see Allan 1980; Barner & Snedeker 2005; Bloom & Kelemen 1995; Middleton, Wisniewski, Trindel and Imai 2004; Serwatka and Healy 1998; Wisniewski, Lamb, and Middleton 2003; and Wierzbicka 1986, 1988). Yet, hardly any research has determined if abstract count nouns’ referents can be individuated, nor has it given an account of the count-mass distinction of third-order abstract nouns (e.g. concepts, propositions, or ideas).

The purpose of the current study is to provide an in-depth analysis of the countability of abstract nouns, examining in particular those abstract nouns that seem to have ‘dual’ membership in both mass and count categories. Examining both written and spoken corpus data, this study aims to explore the conditions under which dually-countable abstract nouns will appear with count versus mass status. Three separate
analyses will be performed on the data, each relying on separate approaches: ontological status, modification, and contextual semantics. Specific criteria include noun pre- and post-modification, the verbs with which they occur most frequently, the degree to which meaning or conceptualization changes when a noun has count or mass status, and meaning variation among count or mass noun usages.

Each of the three analyses examines patterns that are hypothesized to be methods by which speakers of English are, in fact, able to individuate the referents of abstract nouns. In the first case, certain mass nouns whose referents are third-order abstract nouns show a shift in ontological status in the referents of the same noun’s count version. For example, even though love is an abstract mass noun, the referent of the count noun loves is no longer a third order abstract noun, but a concrete noun that could be further defined to exist in time and/or space, visually or at least conceptually bounded.

Secondly, an examination of the modifiers of 100 tokens of each count and mass version of 12 abstract nouns shows that abstract count nouns more often are pre-modified than mass nouns by any number of adjective phrases or specific quantifiers, providing more semantic content that better defines—possibly even singles out—a particular abstract count noun’s referent. Thus, the greater frequency of count abstract nouns appearing with pre-modifiers suggests a correlation between pre-modification and individuation.

Finally, in examining the frequency of the count vs. mass versions of certain abstract nouns, a pattern of polysemy can be inferred for certain nouns. In some cases, a noun’s ‘count’ version is much rarer than its mass version, and moreover, the contextual usage (verb subcategorizations and theta roles) indicates that ‘countability’ is only a
token of our ability to add a plural marker, which usually results in the meaning “instances of (noun),” as if the mass version is ‘default.’ In other noun cases, count versions are much more frequent than mass versions, and also are more likely to take on entirely different meanings from the mass version. Thus, it is possible that while a count noun and a mass noun may share a certain form, they are in fact distinctly separate in meaning. This finding suggests that a noun can have the same general form in both count/mass versions, but that count versions have distinctly different meanings. Together, the evidence of the frequency analysis as well as a noun’s contextual semantics indicates that those nouns which are polysemous are stored in the mental lexicon in separate entries, despite the same root form.

As a result, the question of count/mass status does not apply as it normally would to a form whose dually-countable versions are assumed to be one lexical item; we cannot ask ‘Does individuation occur in the count form of ‘reason,’ but not in the mass form of ‘reason’?” when the two are in fact, distinct words. Individuation, in these cases, is associated with the count noun’s independent meaning or distinct referent, having only little to do with the mass noun’s referent. While individuation of count forms could also be apparent through verb subcategorization patterns (certain count nouns that are suspect polysems are also more likely to be bounded agents of active verbs), these count nouns are also open to pre-modification influences and other indicators of individuation demonstrated from the previous two analyses.

Moreover, a closer examination of pre-modification and the discovery of polysemy among certain mass/count versions of nouns might also suggest that categories of ‘count’ and ‘mass’ are not absolute. Nouns that take the definite article without the
plural marker –s may be considered to have syntactic ‘mass’ status, but show pre-modification as well as theta roles and verb subcategorizations common to count versions. And, while the meanings of polysems are shown to be distinct (and I suggest that each polysem has a separate entry in the mental lexicon), past research on polysemy generally acknowledges that polysemous items are related to some degree. If this is true, the count/mass question may still apply but to a lesser extent than with nouns whose mass form is the ‘default.’

This study supports the Cognitive Individuation Hypothesis as an accurate explanatory tool for the count/mass distinction. In the cases in which a dually-countable abstract noun is used in count version, we observe more evidence for individuation than in mass versions: the noun’s referent has ontological characteristics more similar to concrete nouns, the noun itself is pre-modified by specific adjective phrases and quantifiers, and the noun takes on agent roles with active verbs. However, this study does not claim that the CI Hypothesis can, \textit{a priori}, be used to predict when a noun will appear in count versus mass status. For one, this study only examines a limited amount of abstract nouns, and it does not include cross-linguistic data. It examines the phenomenon of count/mass attributes of English nouns, though there are plenty of other languages that have count and mass distinctions as well as many that do not (e.g. Chinese). In addition, it does not establish a causal relationship between pre-modification or polysemy and individuation; it illumines a set of sufficient conditions for individuation ascertained by the aforementioned evidence.

In regard to each of the analyses, this study glosses over any philosophical problems having to do with word-to-object reference. It assumes that noun referents that
are material objects have edges that are visually perceived (or physically handled) and therefore individuated; it assumes that second-order noun referents are bound by measurements of time (to varying degrees of preciseness), and that certain concepts are individuated in the mind according to contemporary cognitive theories. The second section of analysis only examines abstract nouns, without making any assumptions about the pre-modification patterns of concrete nouns (which may be individuated otherwise). Finally, this study does not examine what Croft (1998) called nonce usage, or unconventionalized pragmatic instances of nouns; for example, the [do a (Name)] construction like “do a Napoleon” (1998: 164). In many of these instances, nouns (abstract or concrete) that are traditionally just mass or count nouns can be metaphorically extended at a speaker’s will to change their senses and produce a desired communicative effect.

Finally, this study makes use of language data from a rather large corpus of contemporary American English compiled from media sources. While it may be that the corpus does not necessarily represent spontaneous conversation as well as other corpora, it does contain a large wealth of information that is incredibly prevalent in the public domain and generally representative of conventional American English usage. This method of language data collection is focused more on frequencies and patterns which matter more than the ultimate size of the corpus. Moreover, if someone were to replicate this study in several years, using new corpus data, and found differing results, it is not to the discredit of this study; it might merely reflect a change in language usage trends. Finally, it is important to note that although corpus studies are touted for being ‘neutral,’ interpretation of frequency and collocation statistics are produced by way of an individual
researcher—and it is the hope that the combination of these two resources (a vast wealth of linguistic data, and individual experience and introspection) produces accurate and insightful results.

The sections that follow will include a summary of related prior research, an account of the method of analysis and the corpus that will be used, a section devoted to description and discussion of the results, and finally, the conclusions and implications of this study.
LITERATURE REVIEW

Before we begin a discussion of the past studies on the count/mass distinction of nouns, we should first be clear on the nature of the nouns of interest in this study, abstract nouns. Schmid (2000) wrote that traditionally, “the most common way of conceiving of the abstractness of words is in terms of the nature of their denotata” (p. 63). One sense of ‘abstractness’ is that what the noun denotes cannot be seen or touched; yet another more complicated examination is based on ontological status. Based on Lyons’ (1977) “common-sense” classification of first, second, and third order entities, Schmid argues that there are varying degrees of abstractness. First order noun referents are traditionally considered concrete entities that are physically present in space, and which have fairly constant perceptual properties. First order nouns include people, animals, and other organisms or material objects. Second and third order nouns have traditionally been lumped together into the abstract category, though Lyons and others (Asher 1993, Bennet 1988 and Parsons 1990) support two classifications for such nouns. Second order entities are events, processes and situations that are “located in time and which, in English, are said to occur or take place, rather than to exist” (Lyons 1997: 443). Finally, third order entities are truly ‘abstract,’ insofar as they are ideas that are outside place and time, such as concepts, propositions, and ideas. While very recent studies by Barner et. al (2007) examine the count/mass status of second-order abstract nouns (punctual and durative events), the attention of the current study will center on third order abstract count and mass nouns.

Turning now to the count-mass distinction, it was first described by Jespersen (1927), a traditional grammarian, who observed that nouns may “apply to all such things
(this word taken in the wholest possible sense) as can be counted,” and that the countables may be either material things like houses, horses, portraits, or flowers; or “immaterial things of various orders like days, sounds, words, sonatas, events, crimes, errors, mistakes, ideas, plans, tasks, etc” (Jespersen 1927: 114). In addition, there are many words that represent “uncountables,” which “do not call up the idea of any definite thing, having a certain shape or precise limits. These words are called mass-words” (Jespersen 1927). Similar to count nouns, mass nouns can “denote some stuff or substance in itself independent of form, such as silver, water, butter, milk, tea, powder, air, etc.” as well as immaterial mass words like leisure, music, progress, success, tact, common sense, and knowledge. This grouping also contains ‘verbal substantives’ from verbs, like admiration, satisfaction, refinement, and from adjectives like restlessness, clearness, and safety (Jespersen 1927: 114-115, and cited by Serwatka and Healy 1998).

As Gathercole (1986) explains, since Jespersen’s initial explication, linguists, grammarians and philosophers have taken four main approaches to the count/mass distinction in nouns. She summarizes them as follows:

1.) Deep Structure View: All terms are essentially alike, and the countability of a noun is derived from deep structures in which measure words (quantifiers) occur. (1986: 152)

2.) Semantic View: The count/mass distinction is a constant feature of the meanings of words themselves.

3.) Contextual View: The count/mass distinction is based on the way a noun is used and how it is interpreted, and varies from context to context.
4.) Ontological View: The count/mass distinction applies not to words, but to their real-world referents, and is based on the differences in entities we encounter.

The initial discussion will focus on several of the most significant findings from each approach, as well as accompanying relevant criticisms and the implications, before examining several current trends and studies in more detail, and identifying remaining questions for the count/mass distinction in abstract nouns.

Syntacticians have used a number of criteria to determine the membership of a noun in one of the two categories (see Noonan 1978). The first feature defines count or mass status in terms of plurality; count nouns appear in both singular and plural forms (they can take the plural morpheme), while mass nouns do not have a plural form (or, they lack number contrast; see Quirk, Greenbaum, Leech & Svartvik, 1972.) Count nouns in the singular do not occur with the zero article, whereas mass nouns do, though they are formally singular. Count nouns take the indefinite article *a* or *an*, as well as other determiners *one, each, every, either*, and so on. (Serwatka and Healy 1998). Mass nouns, on the other hand, do not take indefinite articles, though they do take ‘unstressed’ *some*, as well as *any, enough, and a lot of*. They take quantifiers *much, little, or less*, but count nouns do not. Count nouns in the plural instead take the quantifiers *many and few*. The table below demonstrates such syntactic features specific to count and mass nouns.
Table 2.1

Syntactic Features of Count and Mass Nouns

<table>
<thead>
<tr>
<th>Feature</th>
<th>Count Nouns</th>
<th>Mass Nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plural form</td>
<td>Beans</td>
<td>*Rices</td>
</tr>
<tr>
<td>Indefinite article</td>
<td>An idea</td>
<td>*An advice</td>
</tr>
<tr>
<td>Zero article</td>
<td>*I need shirt.</td>
<td>I need clothing.</td>
</tr>
<tr>
<td>Much</td>
<td>*There are much task(s) to do.</td>
<td>There is much work to do.</td>
</tr>
<tr>
<td>Many</td>
<td>I have many bottles.</td>
<td>*I have many water.</td>
</tr>
</tbody>
</table>

However, this syntactic approach is only superficially descriptive of a noun’s form, and suggests that nouns can only have count or mass status when preceded by a determiner, even though we know that nouns like knowledge and facts differ from one another outside of sentences. Furthermore, while some research has proposed that the count/mass distinction extends beyond surface grammar to deep structure as previously mentioned, plenty of evidence is to the contrary. For one, it is not clear at all that all nouns are mass terms, especially (as pointed out by Ware 1979) for nouns whose singular and plural form are homophones, and whose singular form seems to be empirically prior or primary (i.e. lamb, deer, steak, etc.). Moreover, a deep structure theory cannot give a full explanation for the instances in which we can drop a measure word (i.e., two coffees/The ___ coffees are on the table) (Gathercole 1986: 158). As Ware (1979) also pointed out, in a deep structure theory, we should be able to recover the dropped quantifier or measure word, but unless we know the context, we cannot be sure (cups? orders? flavors?). Because the deep-structure approach is unfavorable among current
researchers due to its theoretical weaknesses, the current study does not examine the countability of nouns from this approach.

A good deal of past count/mass research has been from the semantic approach, in which researchers support the notion that count- or mass-hood “lies in the terms and not in the stuff they name” (Quine 1960: 91; see also Chomsky 1965). Some of the earliest theories proposed that the count/mass distinction coincided with how objects (count nouns) and substances (mass nouns) are measured. Much of this theorizing also determined that the count or mass marking on a noun has something to do with the co-occurrence restrictions as well; for instance, if one used the quantifiers “much” or “many.” Even though supporters of the semantic approach hold that nouns are permanently marked as count or mass, we know that nouns are not fixed in interpretation. In addition, there seem to be plenty of nouns that have both count and mass status (‘dual countability’), for instance, paper, wood, glass, fruit, chicken, idea, and meaning, which suggests that nouns are interpreted as count or mass on the basis of something other than nouns’ unseen lexico-semantic features.

Perhaps in direct opposition to the semantic view are those who support the contextual view, who believe that nouns are not marked at all for count or mass status. Citing the examples above plus many more, supporters of this view show that there are contexts which mandate that nouns (or NPs) take on both count and mass features. Allan (1980) acknowledged that some nouns are more likely to show up as count or mass nouns, and we can therefore conclude that nouns have (1) a hierarchy of contexts that determine countability, consisting of strong and weak quantifiers (in a general sense of words that determine how the noun is counted), and (2) nouns have “countability
preferences” (1980) in which acceptability of the contexts in (1) vary. Gathercole (1986) also supports the view that context determines the count/mass status of a noun, according to her research conducted with child acquisition of the count/mass distinction.

Finally, we turn to the ontological approach, on which much of the current research for the count/mass distinction is centered. An ontological approach specifies that the count/mass distinction does not apply to the words or the context, but rather to the objects themselves that are being talked about—or perhaps how we perceive them. The earliest and most basic rule was that count nouns referred to objects, while mass nouns referred to substances. However, there are many pairs of concrete nouns which have essentially the same referent, but one is a count noun and one is a mass noun (e.g. noodles & macaroni). Other linguists proposed that item boundaries (Jackendoff 1991) in fact determined count or mass status, and still others believe that there is a perceptual and/or conceptual basis for the count and mass noun categorization which seems to be the current trend in count/mass theory. This study approaches the count/mass distinction from each of the last three approaches in its three analyses, though an ontological-conceptual basis for a noun’s count-mass status poses particularly intriguing aspects for abstract nouns—so we now begin a more detailed discussion of recent theory and findings.

Wierzbicka (1988) is one linguist who described a cognitive approach to determining a noun’s count or mass status. She proposed a very detailed taxonomy of noun classifications in her study, “Oats and wheat: mass nouns, iconicity, and human categorization,” and suggested a number of different motivations for classifying a noun as count or mass, including arbitrary divisibility, heterogeneity, perceptual
conspicuousness, and how people interact with an entity. Her explanation for arbitrariness is perhaps the least generalizable; in one example, she described that anthropomorphic properties provide hidden standards which guide speakers of English in their use of certain words. She went on to state that rocks are not man-made and are found on the Earth’s surface, but stones are throwable, and pebbles are small enough to be grasped between the finger and thumb. In addition, Wierzbicka labeled heterogeneous groups of objects as mass nouns, (i.e. superordinate categories like ‘furniture’) since the entities in a group cannot be counted and are thought of as a group of objects used for a particular purpose. Furthermore, Wierzbicka hypothesized that in other cases, the nature of a person’s encounter with an instance of a noun will play a role in whether it is considered a count or a mass noun. Thus, harvesting and eating habits illustrate that it is more common that a person encounter a limited quantity of oats on the breakfast table, but a mass quantity of a crop of wheat (1988: 532). Most emphasized, however, is her hypothesis that the count and mass distinction comes from ease of distinguishability—more generally what linguists have come to call the Cognitive Individuation Hypothesis. For example, according to her hypothesis, leaves are countable because they are more easily distinguishable than, say, (blades of) grass.

Supporters of the Cognitive Individuation Hypothesis hold that whether a person uses a count or a mass noun to refer to some aspect of reality depends on whether they interpret the referent as an individual or as a non-individuated entity (e.g. Bloom 1994, 1996; Bloom & Kelemen, 1995, Imai, 1999; Langacker, 1987; Wierzbicka, 1988; Wisniewski, Imai, & Casey, 1996). For example, as Wisniewski et al. (2003) explain, individuation relies on entities being discrete and bounded, whereas entities that cannot
be individuated are continuous, unbounded, and arbitrarily divisible. So, individuated entities will include substances with clear boundaries (e.g., a puddle), parts of objects (e.g., a finger), and collections of objects (e.g., an army), to name a few, which are easily individuated. Analogously, the notion of a non-individuated entity is typically more abstract than the notion of substance, including phenomena like sounds (e.g., thunder), physical events (e.g., sleep), mental events (e.g., reasoning), and emotional states (e.g., anxiety), for example. Most research using the CI Hypothesis also sets out to define what *individuation* is; for example, Wisniewski et al. (2003) described individuation in terms of ‘scope of predication’. That is, Wisniewski et al. claimed that we can only predicate characteristics to an arbitrary portion of the noun in question if it is a mass noun, for example, both a tablespoon and a gallon of school glue are sticky, smelly, white, and so forth, but ‘has a tail’ or ‘is alive’ cannot be uniformly applied to a group of cats, only to individual cats (2003: 587).

Recently, researchers like Middleton et al. (2002) and Wisniewski et al. (2003) conducted a series of experiments with the noun classes of superordinate categories, aggregates, and sights/sounds to test for a conceptual basis for the count/mass distinction. Middleton et al. tested whether undergraduate students’ perceptions of certain aggregate nouns coincided with the ease of individuation and the nature of encounter hypotheses. Though their findings supposedly statistically supported the Cognitive Individuation (CI) Hypothesis, several questions still remain. The most common rebuttal to the theory is that there does not seem to be a huge difference in ‘distinguishability’ between, say, peas or small beans and grains of rice, or with noodles and fettuccini, but we know that one is count and one is mass. Furthermore, as Wisniewski et al. (2003) have already pointed
out, speakers sometimes communicate about aspects of an entity in ways that do not
demonstrate conceptual individuation—and sometimes even contradict it. Wisniewski
quotes Paul Bloom, (from June 2002, as cited in Wisniewski et al. 2003: 610) who said,

I have no doubt that I think of a piece of toast as a singular individual, but—due
to a quirk of English—I have to talk about it using the word ‘toast,’ a mass noun.
So I ask you, ‘Do you want more toast?’ while thinking of a singular entity.

Both of these objections raise serious doubts for a perception-based categorization rule,
though perhaps what is most contradictory to the hypothesis is that there are a great many
nouns that are not physically perceivable at all. The class of abstract nouns is
characterized by the lack of physical presence in space (and in some cases, time); the
difference, therefore, between many ideas and some advice seems to be completely
arbitrary. While this study does not claim that the CI Hypothesis is without flaws, among
the other proposed theories accounting for count/mass distinctions, it is the most readily
applicable to abstract nouns and the most generalizable. Just in the fact that the referents
of abstract count and mass nouns are third order, they cannot be addressed by either a
substance/object hypothesis, an interactional hypothesis (Wierzbicka’s rock/stone
distinction), or a heterogeneity or divisibility hypothesis.

As previously mentioned, one focus for linguists who attempt to examine a
noun’s count-mass status is those nouns that have ‘dual countability,’ or the ability to
occur as both countable and non-countable. Wierzbicka also examined the “double
conceptualization” of certain things from an ontological approach. For example, the
substance chocolate is not clearly individuated, whereas the objects that come in a variety
box, chocolates, have obvious boundaries and even their own individual compartments.
She noted that such ‘dual membership,’ typically in the mass-to-count conversion (but also occasionally count-to-mass), occurs for substances which can occur as self-contained entities, for “substances which are hard or at least firm,” (1988: 510). From another ontological approach (but not from a CI Hypothesis perspective), Serwatka and Healy’s article “On the Status of the Count-Mass Distinction in a Mental Grammar” (1998) points out identifiable patterns for certain dually-countable nouns. They cite several examples of such pattern sets: some mass nouns, like coffee, beer, water, and soup are often used as count nouns implying the meaning “a serving/measure of” or “a kind/type of.” Thus, two coffees would mean two cups of coffee, and two fruits would mean two kinds of fruit. However, Serwatka and Healy point out that the pattern is only limited to food-related contexts—though only certain foods appear to follow the pattern; it might be acceptable to say “I have two soups,” but to say “(*I have two broths” is questionable. “I have two broths” does not seem to indicate either that I have two servings of broth or two kinds of broth, though perhaps given the right context, we could find one interpretation acceptable.

By and large, most abstract nouns fall into the classification of mass status. Certain abstract nouns can also have dual membership, as previously noted: for example, the abstract nouns time and speed can have both count and mass status, and they both seem to follow Serwatka and Healy’s rule of “a measure of x” when they exist as count nouns, which might seem to imply that all abstract nouns begin with mass status. In addition, Serwatka and Healy (1998) point out that some abstract nouns are countable when they mean “an instance of” something, for example joy, truth, love, honor, pleasure, effort, interest, and charm. However, they also point out that others are not
countable, like knowledge, information, advice, pride, happiness, confidence, shame, and anger (1998: 115). Similarly, there are several abstract nouns that only exist as count nouns (refuting the notion that mass nouns are necessarily more abstract than count nouns), such as category, decision, policy, situation, stipulation, idea, and theory. While these descriptions are somewhat helpful in understanding different instances of individuation, because Serwatka and Healy are concerned with the way in which particular nouns are learned, such descriptions are not useful for this study. Moreover, of particular interest for this study are several abstract nouns, like experience and reason, which can be construed as either count or mass, though with considerable meaning variation.

Discerning the mass or count status of an abstract noun, therefore, raises several questions that have not yet been answered by past research on abstract nouns or on the countability of concrete nouns. The first question is if it is possible to apply the principles of the CI Hypothesis to abstract (dually-countable) nouns, given they are not visible objects. Contingent on this query is an adequate description of exactly how individuation is operationalized in count versions of abstract nouns, by ontological status of referents, types of pre- and post-modifications, and meaning according to the contexts in which the nouns are used. Once individuation is established, the following question is to what extent is a count or mass status binary; in other words, are abstract nouns easily classified as count or mass, or are there degrees of countability as Gathercole (1986) suggests. Finally, the data analysis should indicate in the end whether the CI Hypothesis predicts countability, or is a better descriptive tool.
METHOD

Given the goals for this study, the most suitable method of research will be analysis of dually countable abstract nouns from a large corpus of American English. Many scholars have outlined the benefits of using the corpus method for linguistic research, particularly from a cognitive approach. The most straightforward and relevant advantages are that a corpus represents conventional language used in society, a computer can process an enormous amount of data, and the method of retrieving the data is objective rather than intuitive, allowing for replication of a study using the same or different corpora. Furthermore, with large corpora, Schmid (2000) argues that “frequency in text instantiates entrenchment in the cognitive system” (2000: 39), or what he calls the ‘Corpus-to-Cognition Principle.’ Therefore, the corpus method is both useful and legitimate for investigations of linguistic preferences, cognitive functions, and processes.

The corpus used in the current study is the Corpus of Contemporary American English (COCA), compiled by Mark Davies, professor of Corpus Linguistics at Brigham Young University. Davies collected and edited electronic texts, designed and implemented the corpus architecture, and designed and programmed the web interface for the corpus (COCA runs on a free version of Microsoft’s SQL Server 2005). It is the first large, balanced corpus of contemporary American English and is available for free on the internet (http://www.americancorpus.org). The corpus contains more than 385 million words from more than 150,000 texts, including spoken, fiction, popular magazines, newspapers, and academic texts, with the most recent collected from late 2008. Approximately 20 million words have been amassed each year from 1990 to 2008, evenly
divided between the five genres of text. The text sources are as follows (taken directly from the corpus):

(1) Spoken: (79 million words) Transcripts of unscripted conversation from more than 150 different TV and radio programs (examples: All Things Considered (NPR), Newshour (PBS), Good Morning America (ABC), Today Show (NBC), 60 Minutes (CBS), Hannity and Colmes (Fox), Jerry Springer, etc).

(2) Fiction: (76 million words) Short stories and plays from literary magazines, children’s magazines, popular magazines, first chapters of first edition books 1990-present, and movie scripts.

(3) Popular Magazines: (81 million words) Nearly 100 different magazines, with a good mix (overall, and by year) between specific domains (news, health, home and gardening, women, financial, religion, sports, etc). A few examples are Time, Men’s Health, Good Housekeeping, Cosmopolitan, Fortune, Christian Century, Sports Illustrated, etc.

(4) Newspapers: (76 million words) Ten newspapers from across the US, including: USA Today, New York Times, Atlanta Journal Constitution, San Francisco Chronicle, etc. In most cases, there is a good mix between different sections of the newspaper, such as local news, opinion, sports, financial, etc.

(5) Academic Journals: (76 million words) Nearly 100 different peer-reviewed journals. These were selected to cover the entire range of the Library of Congress classification system (e.g. a certain percentage from B
(philosophy, psychology, religion), D (world history), K (education), T (technology), etc.), both overall and by number of words per year.

The corpus was used to analyze 18 dually-countable abstract nouns, compiled from web searches for abstract noun lists. They include the following:

Table 3.1

<table>
<thead>
<tr>
<th>Dually-Countable Abstract Nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
</tr>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>Effort</td>
</tr>
<tr>
<td>Experience</td>
</tr>
<tr>
<td>Expression</td>
</tr>
<tr>
<td>Freedom</td>
</tr>
</tbody>
</table>

In the COCA, a frequency search and a collocation search (designated as “relevance” in the corpus search software) were used in the first two and third analyses, respectively. For both the first and second analyses of the dually-countable abstract nouns, one hundred of the most recent tokens of each version were taken, along with their context, from the corpus and analyzed according to pre-determined criteria. For the third analysis of context, the method was a bit different; each noun underwent a set of four queries. Two searches involved a count form of the noun, specified by the plural morpheme, and two searches made use of the mass form, marked by the lack of plural morpheme, as well as restricted contexts to indicate the zero article. Within the two sets of searches, the queries called up two environments; one, when a verb immediately
precedes the noun, and two, when the verb directly follows it (these environments
enforced the zero article). Thus, the four queries are as follows:

(1) Count form [+ (-s)]: Verb + Noun
(2) Count form [+ (-s)]: Noun + Verb
(3) Mass form: Verb + Noun
(4) Mass form: Noun + Verb

Instances of mass nouns are more difficult to search for in the corpus, given first that they
are generally less frequent, and second that the corpus does not tag nouns according to
count or mass status. As a result, it was assumed in this case that while some instances of
both count and mass nouns would be left out due to the grammatical restrictions (mass
nouns can occur with the definite article), enough hits for both mass, in virtue of the zero
article, and count, in virtue of the plural morpheme, would register, especially taking into
account the size of the corpus in use. The verb specifications were used not only to
determine noun placement in the sentence (subject/predicate), but also for determining
semantic features inherent to the kind of verbs the searches returned. Lemmas of lexical
verbs were used in order to ignore those instances of verbs acting as nouns or adjectives,
as well as distracting auxiliary verbs.
DATA ANALYSIS & DISCUSSION

Before delving into certain nouns whose referents undergo ontological shifts from count to mass status, it is necessary to re-state the conditions under which individuation is possible. For this analysis, the type of referent determines the method by which it can be individuated; for example, those first-order nouns whose referents are concrete may be individuated because they are discrete and bounded (Wisniewski et al. 2003), and are perceived as such (either visually or by another modality). Moreover, noun referents that are continuous, unbounded, and arbitrarily divisible are not individuatable. For second-order nouns (referents exist in time but not in space), a similar definition applies, though individuation hinges more importantly on boundaries established by a start point and an end point, indicated furthermore by characteristics such as repeatability or recurrence. Moreover, events and phenomena that are continuous or unbounded are not individuated.

In the second and third analyses, several criteria for conceptual individuation will be presented.

Ontological Shifts

Each of the abstract nouns chosen for analysis in this study are designated as ‘abstract’ because of the third-order ontological properties of their referents; that is, they do not exist in time or space and cannot be visually individuated. However, upon further examination, several nouns that meet these requirements in the mass version do not, in fact, remain so certainly abstract in the count version. While shifts in meaning from mass to count versions will be analyzed and discussed in greater depth later in this study, the ontological shift is of immediate interest because it indicates that visual individuation is in fact possible for the referents of count versions of some abstract nouns because they
become more like first- or second-order nouns. Those identified as such nouns that show such ontological shifts are action, activity, expression, labor, love, and speed.

The clearest example of ontological shift in the referent of a noun’s mass versus a noun’s count version occurs with the abstract noun love. In the mass version, love is an intangible emotion or state that is not bound or discrete (and is the subject of a great number of advice columns because of its abstraction):

46. The surest path to love is knowing yourself intimately, being not just okay with yourself, but an inspiration to yourself. (2008 MAG Essence)

However, in a count version, love will become instantiated in objects or people that receive love from someone, as in the following:

13. "I think I'll be more appreciative of life. My passions and my loves are my family, my close friends and the Washington Redskins.” (2001 NEWS WashingtonPost)

Similarly, with the five other nouns mentioned, what might be an intangible concept in a mass version will become a discreet object or an event that is bounded:

16. This separation of thought and action is crucial to understanding in mime, and takes real work to enunciate physically. (2008 ACAD MusicEduc)
21. The specific **actions** that a particular country or region should take to improve water resources management depend on… (2008 ACAD IntlAffairs)

In one case of the nouns in consideration, though the mass version is abstract, the count version is actually measurable. For example, while *speed* is a continuous phenomenon, *speeds* are measured according to a start and end point, quantified in miles per hour or another set unit.

46. While female majors' feelings regarding gender differences in size, **speed**, and strength were reinforced as a result of the unit, they were extremely confident that they could better teach flag football. (2008 ACAD PhysicalEduc)

5. Testing day was clear and sunny, and all the roads were dry. **Speeds were** measured using the in-car speedometer; no additional equipment was used. (2003 MAG PopScience)

That abstract nouns are ‘unabstracted’ in count versions is significant for the CI Hypothesis. While there is a degree of metaphorical creativity inherent in being able to switch from count to mass status in concrete nouns (“Get the *waters* out of the refrigerator,” or “There was *squirrel* all over the highway,”) the use of a count version of a noun may arise out of both conventionality and the necessity of being able to individuate, and therefore pluralize, a concept’s instantiation in an object or event. I am not claiming that the existence of an abstract count version of a noun necessitates an
individuated concept related to a mass noun, especially since there are plenty of mass nouns that do not have count versions (nor does it make sense that some should). However, I think it is tenable to assert that an abstract concept or relation whose meaning varies enough to shift ontological status would naturally assume a count version label of the same noun because of an established individuation function.

Modification Analysis

The second round of corpus analysis examined how the dually-countable abstract nouns of interest are modified by semantic content both before (pre-modifiers, non-determiners) and after (post-modifiers) to determine if patterns of modification correlate with a noun’s individuation. As previously mentioned, this approach is inspired by Schmidt’s 2000 study of shell nouns and Allan’s 1980 discussion of the variety of quantifiers count vs. mass nouns can take. One hundred tokens of both count and mass versions of the previously mentioned nouns were collected in context.

Nearly all pre-modifiers for the nouns were single adjectives, while post-modifiers could be prepositional phrases and clauses. Some pre-modifying phrases were very strong, specific quantifiers (i.e. ‘six inspirations,’ ‘the two biggest reasons,’ etc.) and prevailed in count versions only. In post-modification, a noun exhibited preference for between one and three prepositional phrase structures; noun-of-NP and noun-in-NP were the two most common. Care was taken to extract count noun versions of nouns like experiences rather than the third person singular verb, though it was not possible to solely isolate the appropriate mass sense of the abstract mass noun interest since many newspapers and television shows refer to the monetary sense of the word. The ratio of pre- and post-modifiers of the intended version was applied to 100 for proper analysis.
Some nouns showed a marked preference for post-modification in mass versions, with less in count versions. These nouns included *interest*, *reason*, and *trouble*. Other nouns had about the same amount of post-modification occurrences, and some nouns had many more instances of post-modification among count nouns, such as *effort*, *joy* and *perception*. When all 12 nouns were totaled, post-modification of count nouns numbered 362, while post-modification of mass nouns totaled 398. Thus, approximately 33% of mass nouns had post-modifiers, and 30% of all count nouns had them as well. While it might have been expected that count versions, in order to be individuated conceptually, may have been post-modified more frequently by adding extra information about the noun’s properties, results of the corpus analysis show that there is only a small difference in post-modification of count and mass nouns, and in fact, mass nouns had a few more instances.

Table 4.1

<table>
<thead>
<tr>
<th>WORD</th>
<th>MASS</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Experience</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>Freedom</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Inspiration</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Interest</td>
<td>44</td>
<td>19</td>
</tr>
<tr>
<td>Joy</td>
<td>28</td>
<td>61</td>
</tr>
<tr>
<td>Perception</td>
<td>62</td>
<td>74</td>
</tr>
<tr>
<td>Reason</td>
<td>72</td>
<td>30</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td>Success</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Trouble</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Truth</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>398</strong></td>
<td><strong>362</strong></td>
</tr>
</tbody>
</table>

On the other hand, an analysis of pre-modification of dually-countable abstract nouns yielded a different result. By and large, count versions of each abstract noun
attracted many more instances of pre-modification, except the noun *perception*, which had only two instances of pre-modification for both count and mass versions. The total number of pre-modifications for mass nouns totaled 173, but the total for count noun versions was 472. Thus, while mass nouns were pre-modified only 14% of the time, count nouns had pre-modifiers 39% of the time. On the whole, modifiers appearing before the nouns consisted of one or two adjectives, as in the following examples:

Table 4.2

**Sample Pre-Modification Findings**

<table>
<thead>
<tr>
<th>conservation efforts</th>
<th>spiritual inspirations</th>
<th>threat perceptions</th>
<th>surprising tactical successes</th>
</tr>
</thead>
<tbody>
<tr>
<td>appliance purchase experiences</td>
<td>powerful political interests</td>
<td>immediate and compelling reasons</td>
<td>credit card troubles</td>
</tr>
<tr>
<td>reproductive freedoms</td>
<td>constant joys</td>
<td>bodily satisfactions</td>
<td>economic truths</td>
</tr>
</tbody>
</table>

While most of the pre-modifying roles were occupied by adjectives, there were also a number of quantifying expressions that modified count nouns. The noun ‘reason’ had the most instances of specific quantifying expressions as pre-modifiers, while several nouns did not have any in the 100 tokens examined. However, even after subtracting the number of quantifying expressions from the total number of pre-modifiers of count nouns, all count nouns still had more pre-modifiers than mass nouns (35% > 14%). Therefore, the higher number of pre-modifiers cannot be merely attributed to a syntactic preference for definite quantifiers in a noun’s count version.
Table 4.3

**Total Instances of Pre-Modification per 100 tokens**

<table>
<thead>
<tr>
<th>WORD</th>
<th>MASS</th>
<th>COUNT</th>
<th>QUANT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>22</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Experience</td>
<td>1</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Freedom</td>
<td>4</td>
<td>46</td>
<td>6</td>
</tr>
<tr>
<td>Inspiration</td>
<td>8</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Interest</td>
<td>18</td>
<td>48</td>
<td>0</td>
</tr>
<tr>
<td>Joy</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Perception</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Reason</td>
<td>20</td>
<td>62</td>
<td>20</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>24</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Success</td>
<td>22</td>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td>Trouble</td>
<td>11</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>Truth</td>
<td>29</td>
<td>58</td>
<td>10</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>173</strong></td>
<td><strong>472</strong></td>
<td><strong>56</strong></td>
</tr>
</tbody>
</table>

Taken together, therefore, abstract count noun versions are modified, or specified, more often than their mass versions. The questions that remain are how modification may contribute to the individuation of these entities, and what effects pre-modification has in this process more than post-modification, if any.

Schmid’s (2000) study of shell nouns is an examination of the functional properties of shell nouns; they are useful in characterizing and providing perspective for a noun that originally is devoid of semantic content without the extra information provided by the following clause. Moreover, the additional content aids in the formation of concepts, allowing a speaker to encapsulate an “abstract noun” with more rigid and clear-cut boundaries (Schmid 2000: 17). The majority of this study’s nouns are not shell nouns; except certain cases of ‘reason’ and ‘perspective,’ the noun’s abstraction does not derive from a void of semantic content, but rather, the ontological status of the noun’s referent. Even so, the presence of both pre- and post-modification in a good deal of the tokens
suggests that the extra information provided serves a similar purpose: further describing a noun delineates conceptual boundaries, creating a better understanding for what is being referred to and leaving out other particular meaning variations. To use Schmid’s terminology, modifiers give the illusion that a concept is both *encapsulated* and *reified* because of the properties posited by the modification.

Pre-modification, in particular, seems to play a significant role in the encapsulation and reification of count nouns over mass nouns. While both mass nouns and count nouns attract post-modifiers (typically clauses), count nouns display many more pre-modifiers, including quantifiers. Examples like ‘affirm your *four* freedoms,’ ‘*two* specific inspirations for her costume,’ and ‘*one* of the reasons we see an under-representation’ indicate that there are individual instances of an abstract noun’s referent, which is rigidly defined by particular characteristics (i.e. freedom of *speech*, freedom of *religion*, freedom *from fear* and freedom *from want*). In addition to quantifiers, the lexical modifiers that come prior to the noun serve to designate these particular properties, and may in fact be essential to processing its individuation. Given the original semantic content of an abstract noun, three aspects factor into the ability of a pre-modifier to contribute to individuation: the specificity of the pre-modifier(s) (‘*North America's grandest wildlife* experiences’), the semantic relevance of the modifier to the noun (‘*bodily* satisfactions’), and the frequency with which they co-occur, or conventionality (‘*national security* interests’). A specific pre-modifier more precisely describes an entity than a general pre-modifier. A more relevant pre-modifier would target a core concept, specifying conceptual boundaries. Finally, the more often we hear
(or see) a pre-modifier paired with a noun, the more cemented and conventionalized the particular concept becomes.

That on average, 67% of count nouns are modified compared to only 47.5% of mass nouns suggests that count nouns attract modifiers that help establish conceptual boundaries, thereby individuating them (see table 3.4 below). However, even if this is significant for count nouns, there still must be further explanation for why almost half of all mass noun versions are modified as well. Upon examination, we find that there are several mass nouns that attract significantly more modification than the others: *reason*, *effort* and *interest* more than half the time are modified, compared to only a third of the time for the others. Considering several example sentences, we find that though these nouns occur in the singular without any grammatical marking indicating a count status, they may still behave as count nouns in certain sentences:

23. It is hard to find, tucked away off Elizabeth Avenue, but it is worth the **effort**  

13. Rating 3 1/2 out of 4 Indie auteur David Gordon Green makes his first mainstream **effort** beautifully photographed and often very funny…(2008 NEWS Chicago)

8. A recent video made for a Scientology event that was leaked online peaked people's **interest** in a belief system that has long been surrounded by controversy.  
(2008 SPOK ABC_Nightline)
42. …the outcome in Iraq, winning or losing, affects our national security interest. (2008 SPOK ABC_ThisWeek)

38. Such statistics suggest a gap between common eating habits and right reason. (2008 ACAD TheologStud)

10. The reason for choosing these two levels and not the elementary level was because the risk-taking behaviors… (2008 ACAD SchoolCounsel)

Thus, we find certain sentences in which the nouns seem to have a conventional mass status, but in other sentences, it is not clear that they are indeed mass versions. As a result, the totals for modification for mass nouns may be much lower, and true mass noun versions are rarer. More discussion of a scalar mass/count status follows in the next section.

Table 4.4

<table>
<thead>
<tr>
<th>WORD</th>
<th>TOTAL MASS</th>
<th>TOTAL COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>66</td>
<td>86</td>
</tr>
<tr>
<td>Experience</td>
<td>34</td>
<td>54</td>
</tr>
<tr>
<td>Freedom</td>
<td>28</td>
<td>46</td>
</tr>
<tr>
<td>Inspiration</td>
<td>26</td>
<td>40</td>
</tr>
<tr>
<td>Interest</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td>Joy</td>
<td>28</td>
<td>66</td>
</tr>
<tr>
<td>Perception</td>
<td>64</td>
<td>76</td>
</tr>
<tr>
<td>Reason</td>
<td>94</td>
<td>100</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>52</td>
<td>80</td>
</tr>
<tr>
<td>Success</td>
<td>41</td>
<td>64</td>
</tr>
<tr>
<td>Trouble</td>
<td>39</td>
<td>61</td>
</tr>
<tr>
<td>Truth</td>
<td>34</td>
<td>69</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>47.5</strong></td>
<td><strong>67</strong></td>
</tr>
</tbody>
</table>
Frequencies and Verb Trends

In regard to frequency, for the majority of the nouns, the mass form was more common in the corpus than the count version, with the exception of five nouns: efforts, experiences, interests, perceptions, and reasons (see Appendix). Count forms freedoms, inspirations, joys, satisfactions, successes, and truths were significantly less common than the mass terms. Trouble and troubles seemed equally as common, as well as interchangeable in many contexts. For those nouns whose mass nouns were more common than the count nouns (NOUN1), a pattern of types of verbs emerged depending on the noun’s position as the subject or the object that was uniform for both count and mass nouns:

a. NOUN1 + VERB (inactive)

b. S + VERB (active) + NOUN1 -- most common pattern

For example, in the subject position, truth in the mass form seemed to pair more often with inactive or change of state verbs like ‘remain,’ ‘lie,’ ‘become,’ and ‘seem.’ However, following verbs in the predicate form, truth is ‘spoken,’ ‘sought,’ ‘found,’ ‘discovered,’ and ‘pursued.’ Success and truth had similar results; success in the mass form comes and goes, depends and hinges on things, lies in things, and seems, remains, or is prompted. Truth as a subject remains, becomes, and seems. On the other hand, success as a predicate is achieved, found, measured, defined and guaranteed, and truth is spoken, sought, found, discovered, and pursued. A similar pattern emerges from the nouns inspiration and satisfaction. While freedom and trouble both appeared more frequently as mass nouns, both appeared equally in subject and predicate positions.
However, the opposite was true for the nouns whose count versions were just as common (if not more) than their mass forms (NOUN2) (though the pattern occasionally diverged in the predicate analysis for count versions and mass version)s:

c. NOUN2 + VERB (active) + O — most common pattern

d. S + VERB (inactive) + NOUN2

For example, in the subject position, the noun effort in both count and mass forms paired with active verbs, though in the predicate position efforts received more action than the mass form effort (they were supported, resisted, and complicated). For the noun perception, while both count and mass forms were equally represented in subject placement, the count form seemed to be more dynamic: changing, holding and relating; on the other hand, we talk about perception as existing, remaining, and seeming. Perceptions also are more active as predicates, being influenced, changed, and affected by other forces, whereas perception is something one holds, explains, or senses.

The noun experience had split results; in the end, the count version for experience was more common than the mass experience, though the mass version is more frequent as a predicate. This conclusion resulted from scrutinizing the noun + verb (subject) queries, for which many of the following verbs were actually acting as modifiers rather than verbs; experience working, teaching, living, learning, and so on. Therefore, there is good reason to believe that the count version, experiences, is much more likely to be in the subject position paired with active verbs like lead, become, help, provide, and suggest. On the other hand, they can also be shared, reported, and described like objects in the predicate, though experience is also something gotten, gained, needed, and provided.
Two outliers included the nouns *reason* and *interest*. In reality, the count version of *reason* is much more frequent than the mass form, and in subject position, both *reason* and *reasons* act differently. Both *reason* and *reasons* are reported to tell, discuss or outline things; however, *reason* leads and prevails, whereas *reasons* range and include. In the search queries, it was very difficult to avoid the count forms of *reason* in the noun + verb (subject) query; most hits had modifiers like *the, one, any, or no* that would suggest a count form; thus, the two forms may indeed be much more different than the numbers showed. Similarly, in the mass form verb + noun (predicate) queries, many verbs added to *reason* were part of larger chunks, like “give reason for” and “find reason to.” Verbs that most likely go with mass *reason* include ‘defy,’ ‘abandon,’ and ‘lack,’ and are also much less common than the query shows. In the predicate, *reasons* are offered, provided, given, cited, and suggested, behaving more like objects, whereas *reason* is used and applied.

The data for *interest* poses a difficulty for interpretation because the mass form has two possible meanings that are quite unrelated; one interpretation means “being objectively or personally concerned about something,” though the other has to do with “money paid for the use of money lent” (Oxford English Dictionary). In the data, *interest* as money is more likely to be the subject whereas *interest* as concern is more likely to be in the predicate. For the purposes of this analysis, *interest* as money, insofar as it has little to do with the count form of *interests*, was ignored. Thus, *interest* (concern) as a predicate is generated, created, and feigned, whereas it is much less active as a subject (comes, seems, involves). However, in comparison to *interest* as concern in the mass form, *interests* in the count form are more dynamic subjects, changing, colliding,
conflicting, and diverging. Moreover, they can also be shared, pursued and organized as objects.

Therefore, as a generalization of frequencies and verb trends, whichever form of the noun was most frequent or common, mass or count, was also the noun that occurred with active verbs, whereas the other form of the noun was linked to static or inactive verbs. When the mass form of the noun was more common than the count noun, the nouns more often appeared in the predicate, following active or transitive verbs, becoming the goal or the theme of the sentence. When the count form of the noun was more common, they typically took active verbs as subjects, making them more like dynamic agents or behaving as objects in the predicate. The following section is an examination of the degree to which meaning changes according to use, analyzing the nouns as two groups according to frequency as mentioned above.

Shifts in Meaning in Count Versus Mass Forms

The next analysis examines the environments in which the same or similar verbs appear with both forms of the noun.

Table 4.5

<table>
<thead>
<tr>
<th>Nouns with More Frequent Mass Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freedom</td>
</tr>
<tr>
<td>Inspiration</td>
</tr>
<tr>
<td>Joy</td>
</tr>
<tr>
<td>satisfaction</td>
</tr>
<tr>
<td>Success</td>
</tr>
<tr>
<td>Trouble</td>
</tr>
<tr>
<td>Truth</td>
</tr>
</tbody>
</table>

Take for example *inspiration*, which occurs in both mass and count forms preceding the verb ‘come’:
(1a) Where does your inspiration, your songwriting inspiration come from? I don't know. (2005 SPOK PBS_Tavis)

(1b) His inspirations came from everywhere: modern art (his famous Mondrian dress), Russia ...(2008 MAG TownCountry)

In these two environments, both inspiration and inspirations appear to have very similar meanings; in sentence (1a), inspiration is an indefinable “amount” of something, or a “phenomenon” that influences someone who writes songs. In sentence (1b), something very similar is occurring, except that we intuit that there is not just one unity or force, but a collection of ‘instances of’ inspiration, especially insofar as they come from different locations, as the sentence begins to describe.

Similarly,

(2a) " Tonight we are a country awakened to danger and called to defend freedom. Our grief has turned to anger, and anger to resolution...(2007 MAG Atlantic)

(2b)... And senators' freedom to filibuster may at times preserve freedoms for us all. (1996 MAG WashMonth)

Defending and preserving in both situations seem to be similar enough to agree that the meaning of freedom and freedoms in these contexts is quite close, though again, there is an awareness that defending the whole of freedom is just the tiniest bit different than

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1 I hesitate to use the word “amount” to describe the referent of a third-order mass noun, for an amount implies that there are some kind of boundaries that we might impose to measure it; also, the word “phenomenon” is itself a count noun; however, I have not yet settled upon the appropriate meta-language to describe the un-individuated unity and ‘uncountability’ or ‘muchness’ that is inherent in the meaning of such a noun.
preserving a collection of *freedoms*, especially since Americans have named individual rights, at times referring to them also as ‘freedoms’ (e.g. speech, press, religion, etc.). The following examples confirm that there is a real difference in meaning between mass and count forms:

(3a)…to empathize with others, to understand the subtleties of human interaction, to **find joy** in one's self and to draw it out in others, and to stretch (2008 ACAD TeachLibrar)

(3b) Ozzie, for 20 years you've been my life partner. We have **shared joys**, sorrows, triumph and tragedy…(2004 SPOK CNN_King)

(4a)… he said, noting that much of his **satisfaction** came from exhuming childhood memories of rocking on a grandparent's porch. (2008 NEWS NewYorkTimes)

(4b)… the same conditions that shape individual satisfactions apply to the **satisfactions gained** from affiliations. The affiliation called "friendship " is decisively affected… (1991 ACAD CATOJournal)

The mass noun *joy* in (3a) is found as a “whole” phenomenon, but that there are several instances of *joy*, as sorrow, that are shared between Ozzie and another person in (3b). Similarly, the quantifiers in both sentences of (4) indicate to us that there are indeed two separate interpretations for *satisfaction*, quantified by much, and *satisfactions*, which are actually individually shaped and gained from affiliations. However, it is difficult to understand or intuit individual *satisfactions*, unless we are able to name them as well (e.g. financial satisfaction, romantic satisfaction, etc.).
Consequently, for those nouns that are most likely to occur as mass nouns, the meaning variation from count to mass form, though present, is only a token of our understanding of plurality, and has little bearing on our greater understanding of the sentence and the situation it refers to. Moreover, individuation for plural count forms is best understood when one can actually name instances of the plural noun; otherwise, it is hard to explain the difference between the abstract mass noun and plural abstract count noun. Turning to the other group of nouns, those which occur more or equally as often in the corpus queries than the mass nouns, the data show considerably more variation in meaning:

Table 4.6

Nouns with More Frequent Count Forms

<table>
<thead>
<tr>
<th>Effort</th>
<th>Experience</th>
<th>interest</th>
<th>Perception</th>
<th>reason</th>
</tr>
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</table>

Though *perception*, which like *effort*, has a relatively small meaning variation, corpus data suggests there is more going on in the sentence than a simple change in plurality:

(5a) And it is an unknown factor as to how the use of amphetamines will *affect* *perception* and will *affect* judgment, both known effects of amphetamines. (2003 SPOK CNN_Chung)

(5b)…for additional studies to implement research designs that account for the multi-level factors that *influence perceptions* of interpersonal violence. (2008 ACAD Adolescence)
As was mentioned before, the nouns whose count versions are more common also tend to have more dynamic and active roles in sentences; in this case, *perceptions* can be construed to mean ‘opinions’, whereas *perception* in the first sentence might be more akin to the Oxford English Dictionary’s definition of ‘consciousness’ or a ‘field of vision.’ Even so, it is possible to find sentences in which the mass noun has a closer meaning to the count version, though it is difficult to determine which use of the mass noun is more common. We find similar situations with *experience*, *reason* and *interest*:

(6a) "Social studies programs should include experiences that provide for the study of culture and cultural diversity " (2004 ACAD SocialStudies)

(6b) little lost. But I'm not as experienced yet, but I'm gaining experience every day. You -- you do have so much confidence. (1999 SPOK NBC_Today)

(7a) …at some point all of this is bound to lead, I hope, if reason prevails, to some behind the scenes discussions which will have to involve ultimately Iraqi…I(1990 SPOK CNN_Crossfire)

(7b) There are other reasons cited for this outpouring of affection for Mr. Reagan. (2004 SPOK ABC_GMA)

(8a) …to its old method of making loans to creditworthy people and contenting itself with the interest paid back over many years. And who would trust them, anyway… (2008 MAG MotherJones)

(8b) In particular, our interest lies in how higher education limits students' personal and humanitarian growth through the dominant…(2008 ACAD CollegeStud)
(8c) Rodney D.W. Bowersox is a nationally recognized researcher and educator. His research **interests include** high-speed flow, non-equilibrium gases, unsteady flow, laser/optical experimental methods…(2005 ACAD MechanicalEng)

For the pair in (6), as a predicate or object, *experience* in the mass form is something like a goal; on the other hand, *experiences* in the count form is much less active as a predicate, and is more likely an active agent. In (6a) *experiences* are almost like observations or consciousness of an event, whereas (6b) refers moreso to the knowledge gained from having had underwent what (6a) denotes. Then, considering the pair in (7), there is an even greater variation between the faculty of *reason* in (7a), or the intellectual power that is a very active agent, versus the facts (objects) or *reasons* in (7b) that are also active but separate entities. Finally, there is the largest meaning variation in (8), in which *interest* refers to money in (8a), feeling of concern in (8b), or a cause or principle in which others are interested in (8c).
IMPLICATIONS & CONCLUSION

Conclusion 1

As a result of the contextual analysis of the abstract nouns in this study, several patterns emerge: as the count form of the noun increases in frequency, it also becomes a more active or dynamic subject or predicate; in addition, there also appears to be more meaning variation between the count and mass forms of the nouns when this process occurs. As the processes of metaphorical extension and semantic change affected the nouns in this study, there is the possibility that several count-mass pairs are actually not the same word, but rather polysemous or even homonymous (this hypothesis seems particularly salient for the noun *interest*).

This study suggests that the CI Hypothesis holds as an adequate descriptive theory for the distinction of count nouns (individuated) and mass nouns (non-individuated). Individuation, to varying degrees, is demonstrated through ontological status shifts from third-order mass nouns to first- and second-order count nouns, from the tendency for count nouns to attract specific pre-modifying quantification and adjectival description, and through polysemy, a divergence of related conceptual meanings. However, the CI Hypothesis is not predictive, in that there is no evidence to show it is the reason we use count or mass nouns to refer to certain referents.

Conclusion 2

Data from the second section suggests that while there are clear cases of count nouns whose referents are individuated (typically very specific/quantifying pre-modifiers), and mass nouns with hardly any individuation of their referent at all, there are plenty of examples of nouns that may be placed in varying positions on a continuum of


“individuatability.” Moreover, in these cases, examining the use of the noun in its varying contexts shows that a definite count or mass status label is not always apparent, either. Especially, in the cases in which a mass noun is sought in a corpus search and appears in the singular with the definite article (syntactically plausible for mass nouns), the likelihood of establishing mass status with certainty diminishes:

11. Govern based on sound principals and what they believe is in the best interest of those that they govern. (2008 SPOK NPR_TellMore)

Thus, while Allan (1980) suggested that some nouns are better candidates than others for count or mass status, the data on abstract nouns shows that these nouns in particular blur the spectrum of plurality and individuatability. Moreover, as was previously referred to, there are certain situations that fit Croft’s (1998) *Nonce Use* model, in which a person can pragmatically attribute count or mass status to any noun unconventionally in order to produce a particular cognitive individuation effect. Consider as an example

**There was a huge Buick there, just acres of car (Croft 1998: 165).**

Croft explains that “the word car has a conventional, individuated-object meaning from which a context-sensitive, non-conventional mass meaning can be derived pragmatically. Thus, count and mass categories may in fact be scalar, and can shift according to context and pragmatic use.

**Conclusion 3**

In addition, this study has an interesting implication for the way that certain abstract nouns may be stored in the mental lexicon. According to Schmid’s ‘Corpus-to-
Cognition Principle,’ those items that are most frequent in a corpus are arguably more deeply embedded in our cognition. From this study, one hypothesis is that certain dually-countable abstract nouns are stored as one lexical unit (likely in the mass form), and are derived or metaphorically extended into count form on certain occasions. However, there are a small handful of other abstract nouns whose count forms are just as frequent (if not more frequent) than the mass forms, and which differ in meaning enough that they may be stored as separate lexical units in the mind. Such instances of words with related but separate senses have been previously labeled by linguists as polysemy.

In current cognitive linguistic theory, models of polysemy represent different word senses of distinct lexical items that happen to share the same phonological form (Croft 1998). Most cognitive linguists would also agree that there are systematic ways that the numerous forms are related (Jackendoff 1997, Langacker 1991), and that the forms in some way are complementary; that is, that they occur in mutually exclusive contexts. Thus, it is fairly certain that the nouns in the first grouping (those whose mass forms are much more frequent than count forms) are not polysemous, for we can see that the addition of a plural morpheme does not prevent a count noun version from being used in nearly the same sentence contexts. However, for most of the nouns in the second grouping (those whose count versions are more frequent), there is a divergence of meaning enough to suspect that while their may be a common etymological root, the forms are in fact distinct lexical units.

Croft structures polysemy in this way: there are two independently represented units in the mind, which he denotes as [a/U1] and [a/U2] (where “a” is the form and “U1/U2” is the entry or meaning). In some cases, the forms themselves do differ slightly
(Croft gives the two examples “write” and “write down.”) but are still related. U1 and U2 are “linked by a semantic relation in a network” (1998: 153). This notion of separate, or even redundant lexical entries deviates from formalist theories, in which, either one adopts an independent entries model (homonymy) or derives the second use U2 meaning by a rule, either a grammatical rule (the derivational model) or a pragmatic one (the pragmatic model). Having independent entries that are related—the polysemy model—is ruled out by formalists because it would lead to an illogical redundant mental representation. Cognitive linguistics, on the other hand, embraces the polysemy model, where the “derived” form (a/U2] is redundantly represented by an independent entry and by a semantic relationship between U1 and U2 (1998: 156). Croft claims there is no evidence to the contrary for redundancy, and some research even suggests linguistic knowledge is redundantly represented, in particular with respect to morphological structure (Bybee 1985).

Critics of Croft’s (and others) theory of polysemy claim that there really are no constraints to an intuitive examination of polysemy, and that attempting to posit it generates too many problems when relying solely on “introspective evidence.” A linguist must on one hand, show that two entries are related enough to be polysemous (rather than homonymous) but at the same time, show that each entry has a meaning distinct enough that it must be stored and not computed on the fly (derivational model). Sandra (1999) states, “linguists making such an analysis have too many degrees of freedom, there being no decision principles to help them perform their analysis,” and therefore cannot draw any conclusions about mental representations. His objection may be well-founded; in order to analyze data from a corpus, a researcher brings his or her own intuitions to a
wealth of data generated by a corpus. Yet there is still something to be said for agreement among several individual’s intuitions combined with the statistical frequencies of conventionality and contextual uses that a corpus contains in a vast wealth of linguistic data. Such an approach gives bi-directional support for polysemy (evidence for both relatedness and distinctness, demonstrated above).

Sandra further objects that two polysemous forms may be stored separately in the language lexicon (not in the mental lexicon), but such a connection matters little to synchronic semantics because in the minds of the users, the two are obviously distinct. He claims that it is not possible to establish countable, stable clusters of semantic entities, and that making inferences about mental representations is futile. However, in the case of the nouns that are examined in this study, that there appears to be a continuum of meaning variation and shift in ontological status for certain abstract nouns that share the same form (with the exception of the plural morpheme) is not obvious. Coherence among clusters is a matter of degree; to slice up a network automatically assumes variation and inconsistency. Moreover, while it is not possible to authoritatively claim rigidly separate semantic entries in the lexicon, *conventionalized* distinctions or connections must be part of mental representation—and it was a goal of this study to elicit such conventions from the corpus data. Finally, as Tuggy (1999) suggests, this study does not take for granted a straightforward relationship between mental representations and semantic analyses, but proposes a body of evidence that with future triangulation, may help linguists approach certainty.
Final Summary

This study set out to examine a certain group of nouns that would have posed a problem for the CI Hypothesis, in that they are third-order nouns that are not visually individuatable, but can appear in both mass and count contexts. The results are that individuation was, to varying degrees, achieved through ontological shifts, pre- (and post-) modification, and shifts in semantic meaning. Such processes resulted either in the count version’s referent becoming more concrete, taking on a different semantic meaning than the mass version, or undergoing specific pre-modification that delineated more rigid boundaries and predicated specific properties to the count version of the abstract noun. Even so, individuation is not a binary characteristic but rather is better conceptualized as a continuum, particularly in the cases in which pre-modification seeks to establish boundaries for an abstract count noun. In fact, modification and semantic data show that the categories of count and mass noun are often fuzzy, with some so-called abstract mass nouns taking on qualities of its count version. However, there are certain instances of nouns that seem to have quite separate senses when in count or mass versions, in which case the noun demonstrates polysemy and may be construed in the mind as two separate lexical entries.

As a result, the CI Hypothesis is shown to be a valid descriptive tool for count status, but would be inappropriate as an a priori predictor of count status. More research on a broader selection of remaining English abstract nouns as well as additional work with count and mass status at the third-order level and in other languages is needed to triangulate these results and better define the CI Hypothesis as a universal phenomenon.
REFERENCES


