A CROSS-LINGUISTIC STUDY OF THE ROLE OF CONCEPTUAL CUES IN THE PRIMARY ACQUISITION OF MASS NOUNS IN SPANISH AND ENGLISH

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1. INTRODUCTION

Considerable research has examined the role of biases in early word learning (Bloom 1990, 1994; Bloom and Kelemen 1995; Clark 1987; Landau, Smith and Jones 1988; Markman 1989, 1994; Markman and Wachtel 1988; Waxman 1990 etc.). It has been hypothesized that English speaking children tend to label objects as count nouns on the basis of shape (Landau et al. 1988), and they label non-solid substances on the basis of material (Soja, Carey and Spelke 1991; Subrahmanyam, Landau and Gelman 1999). In the case of nouns that refer to objects, children perceive the objects as bound individuals, and subsequently map the notion of individual onto the grammatical category of count noun (Bloom 1990, 1994). In a similar mapping process, children construe substances as unbound non-individuated entities and categorize the substances as mass nouns. The mapping between the cognitive notions and the two categories is bi-directional. If a child hears a novel word with count syntax, then they will interpret the referent as individual and assign the feature [+INDIVIDUAL] (Bloom 1990). If they hear a word mass syntax, they will assign the feature [-INDIVIDUAL]. However, children often hear words in neutral syntax where the determiner the selects for both [+INDIVIDUAL] and [-INDIVIDUAL] nouns (e.g. the cat, the wood). In this case, children may use conceptual cues to assign the correct feature. However, this learning strategy is not always accurate, given that
there are some mass nouns in English that may be perceived as bounded individuals (i.e. *bread*). When children hear a word used to describe a novel bounded entity, their first interpretation of its meaning is that it refers to the kind of object rather than the material (Bloom 1994). Therefore, children may misconstrue mass nouns referring to objects as bounded individuals and misclassify them as count nouns (e.g. *a rice*). When they hear a novel word for a substance mass noun, the children should not misclassify the noun as count, since they will not misperceive the substance as a bound object.

Much of the previous research in this field has examined mapping and biases in English, and has neglected data from other languages. However, recent findings from cross-linguistic research suggests that young children’s attention to conceptual cues (such as shape and material) may not be based on internal biases or universal word learning mechanisms, but instead maybe driven by the structure of the language being learned (Gathercole and Min 1997; Gathercole, Thomas and Evans 2000; Subrahmanyan and Chen 2006). The hypothesis is that children who are acquiring different native languages may not all show the effects of word-learning biases, or may show the effects to different degrees. In other words, the native language may play a role in determining the meanings a child may assign to a novel word. Categories that are important for English may not be relevant in another language.

The present study addresses the issue of universal word-learning mechanisms by comparing the use of object and substance mass nouns in English and Spanish. In English, nouns and modifiers are assigned to one category or another, either mass or count (i.e. *much/little* and *many/few*). Count nouns can be preceded by an indefinite determiner, can be pluralized, and can co-occur with numerals. Mass nouns traditionally can only occur in the singular and cannot be preceded by an indefinite determiner. The linguistic mass-count distinction is correlated with the ontological distinction between objects and substances. In general, substances are categorized as mass nouns and objects are count nouns. The categorization of a count noun is often tied with the shape of the object.

The structure in Spanish is distinct from English in that Spanish lacks a rigid linguistic mass-count distinction (Gathercole 1997; Gathercole et al. 1997). There is only one pair of quantifiers (much/less) that can be used with either count or mass nouns, and many nouns can be used as either count or mass, depending on the referent (i.e. *queso/cheese—un queso*/*a cheese*). Many more nouns in Spanish than in English can be used in both mass and count noun contexts, and in principle, any noun can occur in the singular or plural. This does not mean that Spanish speakers cannot or do not make a cognitive distinction between substances and objects, rather “their language does not force them to classify every nominal form into one class or the other” (Gathercole et al. 1997). Given the flexibility of nouns in the Spanish language, Spanish-speaking children may pay more attention to functional information than conceptual cues because they have fewer preconceived notions of the categorization of the referents.

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1 It should be noted here that there are some nouns in English that can be used as a count or mass noun, depending on the context and referent. For example, *cake* and *pie* can be used in either context, depending on whether or not the referent is an entire cake or pie (count) or if it is a portion (mass).
A cross-linguistic study of the role of conceptual cues in the primary acquisition ...

The present study examines the role of conceptual cues and the universality of constraints in early word learning by analyzing the spontaneous speech transcriptions from monolingual English and monolingual Spanish speaking children. The objectives are as follows: (1) to investigate children's use of conceptual cues (i.e. shape and material) when assigning new words to the noun categories of mass and count; (2) to test objective 1 cross-linguistically in both Spanish and English in order to examine the universality of word-learning biases.

If the mappings between syntax and meaning are innate and universal (i.e. count NPs are mapped onto individuals), then the results should be similar for the English and Spanish speaking children. However, if the results are asymmetrical, then the findings could challenge the notion that children have universal word-learning biases. The findings would support the alternative hypothesis that a child's native language plays a role in determining the meanings of novel words (Gathercole 1997; Gathercole et al. 1997; Gathercole et al. 2000).

2. METHODOLOGY

Data were extracted from discontinuous longitudinal transcripts from the CHILDES database for seven monolingual English and seven monolingual Peninsular Spanish speaking children, from through the age range of 0;11-3;11. The word list used for this study was based on the list of object and substance mass nouns used in Bloom's (1990) study and Jackson-Maldonado, Thal, Marchman, Bates and Gutierrez-Clellen's (1993) list of early lexical Spanish items. The mass substance nouns searched were identical to those used in Bloom's study: juice, milk, water, sand, and mud, along with their Spanish equivalents: zumo, leche, agua, arena, and lodo. The other 19 words were categorized as discrete objects. In addition to the list of discrete objects from Bloom (1990) (bacon, bread, cheese, celery, furniture, fruit, jewelry, lettuce, mail, money, paper, spaghetti, toast), we have included meat, chocolate, cake, rice, grass, clothes, and food (carne, chocolate, tarta, arroz, hierba, ropa, and comida). All of the available transcripts up to the age of 3;11 were searched for non-adult usages of the mass noun items. Mass noun usages were considered as non-adult when used in an unacceptable count noun context; for example, if the mass nouns were preceded by the determiners a, another in English, un, otro in Spanish, or with numerals. Any compound words that contained the searched item were ommitted (e.g. water hydrant).

3. ANALYSIS AND RESULTS

A series of chi-square tests of independence were conducted to analyze the data for error frequency per language group and per category in each language (homogeneous substances and discrete objects). A total of 1497 items were extracted and analyzed from the English transcripts and 316 items were available from the Spanish transcripts.²

² The amount of data available from Spanish speaking children was significantly less than the data from the English children.
To analyse the relationship between the non-adults usages and the classification of mass nouns, separate chi-square tests were done for the English and Spanish data. As predicted, the English speaking children did produce more errors with discrete objects than with substances. The test showed there was a significant relationship between the mass noun category and the errors ($x^2$ (1, N=1497) $p<0.05$).

A chi-square test was also run with the Spanish data. It was necessary to perform an exact test, due to the smaller sample size and number of errors (N=10). The test showed that the relationship between the categories and the errors was not significant ($p>0.1$). A separate exact test was run to compare the number of errors between the two language groups. The test supports that there is a greater probability that English children will produce more non-adult usages of discrete object mass nouns than the Spanish children (the results approached significance: $p=0.07$).

In summary, the analysis of the English data showed that there was a significant relationship between the mass noun category and the non-adult items. There was a higher probability that the children would produce more non-adult usages in English with discrete object mass nouns than with substance mass nouns. The analysis of the Spanish data revealed no such significant relationship, although a more thorough test could be performed if the sample size were larger. The comparison between the two language groups and the errors showed that the English children tend to produce more non-adult items than the Spanish children.

4. DISCUSSION

The study presented in this paper aimed to test the hypothesis that children use conceptual cues in order to assign the correct feature and map syntax onto the word from the meaning. The study also tested whether or not the shape and material biases are present for both English and Spanish speaking children. According to Bloom's (1990) results, children sometimes misconstrue mass nouns referring to objects as bounded individuals and misclassify them as count nouns. In Bloom's study, the English speaking children produced fewer non-adult usages with the substance nouns, because the children tend not to misperceive the substances as bound discrete objects. In the current study, the monolingual English results supported Bloom's findings. The statistical analysis of the Spanish data did not yield the same results. The test showed an insignificant relationship between the substance and discrete object categories.

Overall, the Spanish monolingual children produced less non-adult usages than the English monolingual speaking children. These results support the initial hypothesis that Spanish children do not rely on the shape bias as much as the English children because they have fewer preconceived notions of the categorization of the referents. In Spanish, the linguistic mass-count distinction is not as fixed as it is in English, which means the learners may not automatically assign the notion of individual to count nouns based on the shape of the object. Furthermore, there are fewer opportunities to produce errors given that there are more grammatical options in Spanish due to the flexibility of the nouns.
In conclusion, the present study provides evidence that object and substance labelling may be affected by language-specific influences. It is possible that even if constraints and biases play a role in early language acquisition, the language-specific influences may override universal tendencies. Additional research using experimental data is necessary to confirm these findings.

REFERENCES


