
29. WORD CLASS DISTINCTIONS IN AN INCOMPLETE GRAMMAR*

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INTRODUCTION

The acquisition of word classes and their distinctions has long attracted researchers of language, and Ruth Berman's contribution to this topic has played an important role in first language acquisition literature (Berman 1985, 1986, and particularly 1988).¹ This paper examines the knowledge of word classes under incomplete acquisition, a previously uninvestigated area of inquiry.

Incomplete acquisition is defined here as the acquisition of L1 by a healthy child who starts out either monolingual or dominant in L1 but switches to another language (L2) as primary before age 10.² Such speakers, who end up controlling two or more languages but are dominant in the language they acquired later (L2), are referred to as "incomplete learners," or alternatively, as "heritage speakers" (Valdés, 2000).³

* I am grateful to Farrell Ackerman, Mark Appelbaum, Elizabeth Bates, Soonja Choi, Olga Kagan, Robert Kluender, Beth Levin, Cecile McKee, and Asya Pereltsvaig for helpful discussions of this work. All errors are my responsibility. This work was supported in part by a grant from the University of California Academic Senate.

¹ The very notion of word class has many names in linguistic literature: aside from 'word class', the terms 'lexical category' and 'part of speech' are also often used. All these terms are interchangeable, and I will be using 'word class', simply following the terminology used by Berman.

² No matter what cut-off age is chosen, it will always be a bit arbitrary. The choice of age 10 allows us to stay safely below the critical period (Newport, 1990; Hurford, 1991) and avoid problems that arise in studies of later bilinguals (12–14) whose language competence is not clearly known.

³ Each of these two terms corresponds more or less to a different field of study; the term 'incomplete learner (acquirer)' is more common among scholars interested in the acquisition and structural characteristics of such language; the term 'heritage speaker' was originally introduced by specialists in language pedagogy but has been gaining popularity in other fields as well. Other terms are used as well (attriters, semi-speakers), see for example Seliger and Vago, 1991; Dorian, 1981, 1989. Throughout the paper, I will be using the term 'incomplete learners'. Incomplete learners are compared to uninterrupted learners, that is, the learners whose first language acquisition was unimpeded by another language.

An incomplete learner, therefore, is arguably a competent speaker of L2 who does not fully control his/her L1 as a result of the order in which he/she acquired the languages.⁴

Little is known about incomplete acquisition in general, let alone the fate of word classes under incomplete acquisition. In this paper, I will present the results of an experimental study which investigated the knowledge of major word classes (verb, noun, adjective) under incomplete acquisition. These results, however preliminary, may in the long run bear upon general questions pertaining to the acquisition of lexical categories.

In presenting my study, I follow the outline of Berman's 1988 paper on word class distinctions in uninterrupted acquisition. Like most researchers in this area, she initially describes the general distinctions between nouns, verbs, and adjectives - the three major classes of content words (see also Maratsos, 1981, 1982, 1988). In section 1, I will review typical motivations for the distinction between verbs, nouns and adjectives. Two main schools of thought exist with respect to the way in which a child develops word class distinctions: through semantic associations or through formal associations. Whichever is right, researchers agree that the knowledge of word class distribution develops by age 4-5 (Berman, 1988: 54). While many researchers focus on the developmental stages prior to the acquisition of lexical category distinctions, it is probably safe to assume that an L1 speaker whose acquisition was interrupted at or after age 5 already possessed the knowledge of word class (lexical category) distinctions; this is one of the crucial assumptions made in this paper.

Assuming that an incomplete learner retains word class distinctions after switching to his dominant language, what are those distinctions and how do they differ from/resemble the distinctions observed in a fully acquired language and in the language which is dominant for the incomplete learner? Specifically, are verbs considered similar to nouns and/or adjectives in incomplete acquisition? This question is at the core of the experiment described in section 2 of this paper. The results of this experiment are presented in section 3. Section 4 presents a general discussion of these results; the overall summary and questions for further study are outlined in the conclusion to the paper.

VERBS, NOUNS, AND ADJECTIVES IN LANGUAGE

The representation of word class in general is a complicated issue in and of itself. It is generally assumed that word classification relies on the formal properties of words (distribution, range of syntactic functions, and the morphosyntactic properties associated with a given class) but may also rely on some semantic principles which are arguably somewhat independent of language-specific characteristics (Schachter, 1985; Maratsos, 1982; Braine, 1987).

⁴ Conditions leading to incomplete acquisition can occur under emigration, where a young child moves from the area where L1 was dominant to a new place where that language is a minority language. Similarly, incomplete acquisition can take place if a child is born in a minority language speaking family in the L2 area. Since the interaction of dominant and minority language has traditionally been studied under the rubric of sociolinguistics, little is known about structural properties of incomplete acquisition.

Speakers are known to possess several distinctions between various word classes, although the mechanisms of their storage in the brain are not well understood. The first distinction is between content(ive) words and function words (or in the generative tradition, between lexical and non-lexical categories).⁵ Content words include nouns, adjectives, verbs, whereas function words include adpositions, determiners, conjunctions. The next distinction, one among content words, is the contrast between nouns and verbs. They have been contrasted in terms of various features: concrete vs. abstract, lexical-semantic vs. grammatical information, less vs. more inflectional categories (see Schachter, 1985; Druks, 2002 for useful reviews).

The noun-verb distinction figures prominently in first language acquisition. Research on healthy complete acquisition shows that children use different strategies in learning nouns vs. verbs (Braine, 1987, 1988; Maratsos, 1981, 1982, 1988, 1991; Berman, 1988; Levy, 1988). It is also possible that there may exist a number of developmental profiles with respect to the acquisition of grammatical classes (Fenson et al., 2000; Thal et al., 1997). Evidence also exists of cross-linguistic variation with respect to the learning of nouns and of verbs; the acquisition of some languages seems to be noun-centered whereas others show less noun bias in acquisition (Choi & Gopnik, 1995; Choi, 1998; Tardif et al., 1999; Caselli et al., 1995; Maratsos, 1998). Research on language impairment shows selective impairment with respect to word classes (see Shapiro & Caramazza, 2002; Druks, 2002 for reviews). Thus, word classes show different behaviors under both healthy acquisition and language impairment. If this is the case, one might expect that incomplete learners would also show selective control of word classes. However, it is impossible to predict exactly how the differences in word classes are realized in incomplete grammars.

Predicting selective control of word classes in incomplete learners is difficult partly because no clear consensus exists among researchers with respect to which word classes are favored over others, and partly because little is known about the principled ways in which incomplete learners differ from uninterrupted learners. There are several possibilities. First, an adult incomplete learner could have the same word class knowledge as an adult uninterrupted learner, an unlikely but not impossible scenario. Second, incomplete learners could have selective control of word classes such that it matches the stage at which their acquisition was interrupted; this would mean that they are simply 'frozen' at the developmental stage where their L1 acquisition was no longer progressing. Third, they could show word class knowledge different from that found in the fossilized stage and also different from the knowledge exhibited by adult uninterrupted learners. And finally, incomplete and uninterrupted learners could differ in their knowledge of lexical items based solely on frequency: on the assumption that incomplete learners know fewer lexical items, it is plausible that they would know the more frequently encountered ones and would not show any selective control of word classes.

⁵ To be precise, the content/function word distinction and the lexical/non-lexical category distinction do not exactly match; the main difference is in the treatment of adpositions which are considered function words in the former approach but are included in lexical categories in the latter approach (Chomsky, 1995). For a more fine grained approach to adpositions in generative grammar, see Yadoff (2000), Baker (2003). The differences between the two approaches do not affect the main points pursued in this paper and I will ignore them below.

To test which of these possibilities occurs in an incomplete grammar, we conducted a set of simple comprehension experiments involving complete and incomplete learners of Russian. These experiments are described in the next section.

NOUNS, VERBS, AND ADJECTIVES IN INCOMPLETE AND UNINTERRUPTED LEARNERS: AN EXPERIMENTAL STUDY

Subjects

The subjects of the experiments were five incomplete learners of Russian and four competent speakers of Russian, all males. Of the incomplete learners of Russian, three were born in the former Soviet Union and arrived in the USA at ages four (D; M) and six (V). The two other subjects were born in the USA, and, according to self-report, had been monolingual in Russian until they started preschool at age four (Z) and kindergarten at age five (B). The subjects were in college at the time of the experiment; their average age is 19.8. None of these subjects can read Cyrillic; they all assess themselves as 'fairly good' speakers of Russian (usually a sign of a weak speaker) but they almost never use Russian to speak to their family members; the usual pattern is of being spoken to in Russian and responding in English. The four competent speakers were all recent arrivals in the USA from Russia (Moscow and St. Petersburg) and had been in the USA for less than a year at the time of the experiment. They all completed high school in Russia, and two of them had a higher degree. Because it is harder to find college age speakers with a short-time exposure to English, the average age of these subjects was higher, at 33.

Materials and procedure

The stimuli included nouns, verbs, and adjectives taken from three frequency ranges of the Russian frequency dictionary (Brown, 1996): high frequency items (100–1,000 frequency range), mid-frequency items (1,500–4,000 frequency range), and low-frequency items (4,001–10,000 frequency range). Within each frequency range, 11 items were selected from each word class, giving a total of 33 per class. Words which have Latinate or Anglo-Saxon cognates were avoided. Within a single frequency range, words across classes were chosen to match in frequency and in word length, but in case of conflict between these two criteria, frequency was given preference.

Procedure. The incomplete learners were tested in two separate experiments on separate days. In Experiment 1, they were presented with the randomized audio recording of the test materials (using PsyScope Experimental Shell—Cohen et al., 1993). The instructions, presented in English, asked the subjects to push the 'yes' button if they know the word they hear and the 'no' button otherwise. For each subject, reaction times before response were recorded. In Experiment 2, the same subjects were asked to translate the randomly presented words into English. The goal of this experiment was to double check whether or not the responses received in Experiment 1 were realistic or the subjects were assuming they knew more than they actually did. The subjects were not informed of Experiment 2 until Experiment 1 was completed. In Experiment 2, the subjects' interviews were recorded, and the accuracy of translations was checked. If a subject made an error in translation, the errors were analyzed

with particular attention to related words that might have influenced the choice of an incorrect translation.

The comprehension of isolated lexical items poses more of a challenge than comprehension of words in sentences, and the decision to use individual lexical items represented an attempt to create a more difficult comprehension environment and to avoid the influence of contextual factors. Presumably, the contrast between isolated lexical items and lexical items in sentential context had no effect on uninterrupted learners. The latter were tested only in Experiment 1, where the instructions were the same but given in Russian. Both sets of subjects had a training session prior to recording of reaction times; the words used in the training session were different from the stimuli.

RESULTS

Experiment 1. The reaction times for incomplete learners (averaged over all the subjects) are presented in Table 1. The reaction times for uninterrupted learners are presented in Table 2. For each subject pool, the data are broken down by the word class and by frequency range.

Experiment 2. Recall that in this experiment, which involved only incomplete learners, the subjects were offered the test words in Russian and asked to translate them into English. Table 3 summarizes the accuracy of translations broken down by word class and frequency range.

As I mentioned above, we also monitored the strategies used by the incomplete learners when they did not know the translation of a given lexical item. Many individual differences occurred in the use of such strategies, which is why the results are presented for each subject separately.

Table 1. Incomplete learners: reaction times, ms, for three word classes/three frequency ranges (null reactions filtered out; averaged over 5 subjects)

	Verbs	Nouns	Adjectives
High frequency	460	580	698
Medium frequency	612	766	780
Low frequency	744	812	950

Table 2. Uninterrupted learners: reaction times, ms, for the for three word classes/three frequency ranges (null reactions filtered out; averaged over 4 subjects)

	Verbs	Nouns	Adjectives
High frequency	350	360	390
Medium frequency	395	370	360
Low frequency	380	390	410

Table 3. Translation accuracy for three word classes/three frequency ranges (averaged over 5 subjects)

	Verbs	Nouns	Adjectives
High frequency (11)	82%	73%	55%
Medium frequency (11)	80%	64%	27%
Low frequency (11)	59%	27%	9%

Two of the five subjects (D and B) typically ‘gave up’ when they did not know a lexical item and simply acknowledged that. The other three subjects, however, used different strategies in response to the lexical items they did not know. They clearly identified verbs as a class and tried to translate as many as they could. If they did not know a given verb they tried to translate it as something else, usually on the basis of formal similarity between two items. For example, the verb *čtit* ‘honor’ was assimilated to the better known *čitati* ‘read’; the verb *struit’sja* ‘flow’ was assimilated to *stroit’sja* ‘be built’ (M translated it as ‘build’); the verb *bormotat* ‘mumble’ was translated as ‘coil’ based on its similarity with *motat* ‘coil, skein, reel’.

The subjects were less consistent translating nouns, where the number of the lexical items they admitted to be unaware of was higher (Z: 5 nouns; M: 3; V: 7). In two cases nouns were assimilated to words of other classes: Z translated *dolžnost* ‘position’ as a verb, presumably based on the similarity to the frequent verb *dolžen* ‘must’; V assimilated *milost* ‘grace’ to the adverb *malo* ‘a little’ and translated it as such.

The subjects failed to translate more adjectives than nouns or verbs (see Table 3) and in a number of cases they simply acknowledged that they did not know those lexical items. Where compensatory mechanisms were used, the speakers were more liberal in assimilating adjectives to words from other word classes, thus:

- (1) Formal assimilation of adjectives
 - a. *krotkij* ‘meek’ assimilated to *korotko* ‘short’ (adverb)
 - b. *smirnyj* ‘docile’ assimilated to *mir* ‘peace’ (noun)⁶
 - c. *smuglyj* ‘dark, tan’ assimilated to *smogli* ‘were able to’ (verb)

DISCUSSION

Incomplete learners’ knowledge of word classes: The range of analytical possibilities

The experiments outlined above contrast two pools of adult speakers, incomplete learners and uninterrupted learners. Ignoring possible individual differences, let us start by recalling the possibilities with respect to the two subject pools that were sketched in section 1.

Hypothesis A: no difference across the groups (incomplete learners and uninterrupted learners have the same word class knowledge, either selective or non-selective)

⁶ This is an etymologically valid connection but it is doubtful the two lexical items are closely connected in the synchronic mental representation.

Hypothesis B: fossilization (incomplete learners' knowledge of word classes is frozen at the developmental stage where their L1 acquisition was interrupted)

Under Hypothesis B, it is reasonable to expect the incomplete learners to show selective control of word classes with preference for nouns over verbs and over adjectives. This expectation is endorsed by the existing research on young acquirers' knowledge of word classes (Berman, 1988; Maratsos, 1981, 1982). Although the acquisition of word classes seems to favor verbs over nouns in Korean (Choi & Gopnik, 1995; Choi, 1998), Mandarin (Tardif et al., 1999), and Tzeltal (Brown, 1998), such selective control, which is opposite to that observed in a number of other languages, occurs much earlier.⁷ At age 5, which is the age when the acquisition was impeded or interrupted for the incomplete learners studied here, the selective control of word classes seems to favor nouns over verbs if only slightly and verbs over adjectives (Berman, 1988).

Hypothesis C: group-specific knowledge (each group shows different control of word classes, but the incomplete learners' knowledge is not due to fossilization)

If Hypothesis C holds, one needs to address the question of what factors other than fossilization determine the selective control of word classes in incomplete learners. In section 1, I mentioned one possible factor: frequency. An incomplete learner and an uninterrupted learner could differ in their knowledge of lexical items based solely on frequency: on the assumption that incomplete learners know fewer lexical items, it is plausible that they would know the more frequent ones and would not show any selective control of word classes.

Let us now see how the experimental results bear on each of these hypotheses.

Overview of main results

The main result is that incomplete learners show selective control of word classes—in other words, they do not treat nouns, verbs and adjectives equally. The selective control of word classes is apparent from the difference in reaction times across classes and is confirmed by the differences in the speakers' translation results for nouns, verbs, and adjectives (Table 3).

This result is robust but not too surprising; after all, the selective knowledge of word classes is observed both under acquisition and language impairment. However, in maintaining selective control of word classes, adult incomplete learners differ from adult uninterrupted learners. The latter are quite balanced in their recognition of word classes, as shown in experiment 1 (Table 2). Across all the frequency ranges, the uninterrupted learners show a slight preference for nouns, but it is not statistically significant. Thus, Hypothesis A is untenable.

It is more surprising that the results with respect to verbs and nouns argue against Hypothesis B. Recall the assumption that fossilization of the 4–5 year old stage in the

⁷ I am certainly at a disadvantage with respect to Russian in that there are no studies on word class acquisition in Russian. Gvozdev (1961: 375) indicates that the production of nouns develops before that of verbs, around 1;9; verbs appear between 1;10 and 2;0. There is no explicit comparison of word classes in a five year old learner, but one gets an impression that the derivation of nouns is richer than that of verbs at that stage (Gvozdev, 1961: 315–320). This would tentatively put Russian in line with the other noun-dominant languages described in the literature. Of course the investigation of word class knowledge in monolingual Russian-speaking children would be a crucial component in expanding this study.

knowledge of word classes should entail favoring nouns over verbs over adjectives. The incomplete learners, however, show a clear preference for verbs in their knowledge of word classes. Thus, while Hypothesis B predicts the ranking in (2), the actual ranking observed in the experiment is shown in (3):

- (2) nouns > verbs > adjectives
- (3) verbs > nouns > adjectives

The ranking in (3) is confirmed both in the reaction time experiment and in the translation task; the procedures yield consistent results.

These results are further confirmed by the behavior of incomplete learners in the translation task. Recall that the subjects tried to replace verbs with verbs and were less concerned with not translating nouns and adjectives. They allowed some word class leakage with nouns and adjectives, but not with verbs. Thus, the use of compensatory mechanisms with the lexical items that the subjects did not know also supports the ranking in (3).

In contrast, the adult uninterrupted learners surveyed here do not show selective control of word classes. Their response times are comparable across the three word classes and only a negligible increase in response time occurs as the items become less frequent. The incomplete learners differ from the uninterrupted learners in two respects: first, in the duration of the reaction times, second, in the verb bias and the general selective response to word classes.

The difference in reaction time is expected; incomplete learners do not control the vocabulary as well as uninterrupted learners, and the difference in reaction times reflects the predictable difficulty in lexical access experienced by incomplete learners. This difficulty is quite apparent in incomplete learners' production (Seliger & Vago, 1991; Dorian, 1989; Polinsky, 1995, 1997, among many others); some researchers suggest that on-line performance is the sole aspect of language that poses a challenge to incomplete learners (Au et al., 2002).

Differences in reaction times notwithstanding, the two groups also differ in their response to different word classes. The uninterrupted learners show no comprehension distinctions for nouns vs. verbs; the incomplete learners show a verb bias. This supports Hypothesis C: incomplete learners do not treat all word classes equally. In addition, the results suggest that the mental representation of incomplete learners includes knowledge of word classes and distinction between those classes. Despite some leakage from nouns and adjectives evinced by the compensatory strategies, the overall boundaries of each of these two word classes seem well-delineated. The performance on adjectives is the weakest on all measures: in terms of reaction times, accuracy of translation, and the use of compensatory strategies when a lexical item is not known. Overall, adjectives do not lend strong support to Hypothesis C and the incomplete learners' performance on adjectives can actually be taken as evidence for Hypothesis B; I will discuss this in section 4.3.

These results go beyond suggesting that incomplete learners have the knowledge of word classes and word-class distinctions. They also show, somewhat surprisingly, that

incomplete learners have a better knowledge of verbs than nouns or adjectives. The next two sections will present some tentative explanations for the observed asymmetries in word classes.

The adjective deficit

Let us start with a simpler problem, that of the incomplete speakers' inferior performance on adjectives. Part of the explanation is suggested by Berman's own work—in discussing the acquisition of adjectives by Hebrew-speaking children she notes that adjectives “constitute a more fluid, less autonomous category” (1988: 64). Berman cites two reasons for such fluidity. First, the semantics of adjectives can be like that of verbs, with the emphasis on transitory properties (e.g. ‘obedient’ or ‘daring’ in our sample) or like that of nouns, denoting more permanent, stable properties (e.g. ‘huge’, ‘difficult’ in our sample). Second, and more important, is the fact that distributional properties of adjectives place them halfway between nouns and verbs (Berman, 1988: 63). In Russian, adjectives share with verbs the ability to function as predicates (without taking verbal inflections), and they share with nouns the morphosyntactic categories of case, gender, and number.

The third factor, one that Berman also notes in passing (1988: 63) regards the learners' restricted experience with adjectives (as compared to their experience with nouns and verbs). One could argue that the incomplete learners perform poorly on comprehension of adjectives that are in the same frequency range as the nouns and verbs that have better comprehension rates. However, the frequency data are based on adult spoken and written corpora, and we have no frequency data on word classes in child-directed speech in Russian. One could hypothesize that even older children (ages 4–6) are exposed to fewer adjectives in the input, which hinders their comprehension. If children's production is any indication, Berman notes a relatively low frequency of adjectives in Hebrew-speaking children's output before age 3 (Berman, 1988: 63), and Gvozdev comments on the late development of adjectives in L1 Russian speakers (Gvozdev, 1961: 437–438).

It is possible that the knowledge of adjectives is more or less a luxury; like relative clauses, adjectives are ‘rhetorical devices’ (Berman & Slobin, 1994: 127), and speakers can say what they need without using them. Likewise, they may achieve a general level of comprehension without knowing the meaning of a certain adjective, especially if the adjective is used to modify a noun: it is sufficient to interpret the head of a noun phrase and the comprehension of an adjective can be sacrificed. Also, if adjectives are less common in spoken language, their overall knowledge gets enhanced by reading literary texts, something that incomplete learners cannot do.

The frequency explanation remains tentative without a quantitative study of the frequency of adjectives in spoken Russian in general and child-directed Russian in particular. If they are on the right track, however, a problem arises for the choice between Hypotheses B and C outlined above. I mentioned earlier that the data argue in favor of Hypothesis C. But if incomplete learners do not know adjectives because they were not exposed to them before their acquisition was interrupted, this argues in favor of fossilization, Hypothesis B. More importantly, it also argues for treating

the core classes such as verbs and nouns different from the class of adjectives. In other words, the possible fossilization on adjectives may corroborate Berman's observation that "children approach the task of adjective-learning rather differently than for nouns and verbs". If so, the poor performance on adjectives is quite unsurprising. Parallels may exist in the performance on adjectives demonstrated by uneducated uninterrupted learners, something we have yet to investigate.

The verb advantage

Why are verbs more thoroughly acquired than nouns (and adjectives)? In addressing this question, let us start with the well-attested observation that young children show a noun bias in their production (unless they speak Korean, Tzeltal, or Mandarin). The following three disclaimers make this observation less relevant for the data discussed here. First, the results on noun bias are generally found in very young children, typically under age 2;6. The speakers surveyed here had their acquisition interrupted later, around age 5; even under the fossilization hypothesis, they could have lost their noun bias somewhere along the way. Second, the results on noun bias are based predominantly on production.⁸ Berman's own conclusions are also based on production, and as she notes, by age 5, Hebrew-speaking children have just a slight noun bias. The third disclaimer to the noun-bias observation has been offered by Maratsos (1998: 844): the strength of noun bias in vocabulary learning may be overrated and may generally fail "to cause a clear, universal persistent difference".

If noun bias is what Maratsos calls "a partly local custom" (1998: 845), then we can assume as the null hypothesis that nouns and verbs have an equal chance in the vocabulary organization following early acquisition. However, recall that nouns and verbs were compared across the same frequency ranges and that the incomplete learners favored verbs within each of those ranges. Why, then, do incomplete learners show such a bias towards maintenance of verbs? (Of course, the concept of 'maintaining' or 'dismissing' lexical items should be treated only as a metaphor; I do not mean to imply that incomplete learners make a conscious decision as to which word class to favor.) The subjects showed deterioration in comprehension as the frequency decreased, but this decline was much steeper for nouns and adjectives than for verbs. Thus, frequency alone cannot be the deciding factor. The role it plays in comprehension is subordinate to the division of lexical items into word classes. Let us consider some alternative hypotheses.

One possible explanation is that the verbs used in this study were acquired earlier than the nouns (and adjectives), which facilitates their retrieval. In production tasks based on picture-naming, a number of researchers show that age of acquisition is a strong predictor of performance on lexical tasks after frequency, word length and word class are controlled for (Carrol & White, 1973; Ellis & Morrison, 1998; Iyer et al., 2001 and further references therein). No conclusive data exist on the age of acquisition

⁸ The bias in comprehension is documented less well; if found, it is also observed in very early acquisition (Goldin-Meadow et al., 1976).

of individual lexical items tested in Experiments 1 and 2, but many of the verbs and nouns denote abstract concepts that are acquired fairly late. For instance, in the high frequency range, the following verbs denote abstract events: 'recall', 'create', 'consist', 'introduce; imagine', 'wish', 'relate', 'judge', 'allow', and 'strive'. Abstract nouns in the same frequency range include: 'occupation', 'state', 'victory', 'happening, event', 'sense, reason', 'structure', 'fame, glory', and possibly 'nature'. Based on the sheer number of abstract concepts, the comprehension of nouns should be equal to or slightly better than that of verbs. Thus, the age of acquisition hypothesis cannot account for the verb bias.

In the following paragraphs, I will consider four other possible explanations for the observed verb bias: morphological identifiability, frequency distribution, syntactic function, and conceptual complexity.

Let us start with morphological identifiability. The citation form for Russian verbs is the infinitive, with the most common ending *-Vt'*, and the second most common ending *-ti*.⁹ The only other ending that can follow the infinitival marker is the reflexive *-sja*. The experiments described above used the infinitive for all 33 verbs, which may have helped the subjects identify the word class as a whole. This morphological identifiability could also contribute to the specific reliance on verbs in compensatory strategies: when the subjects did not know a given verb, they at least knew that the translation should be a *verb*.¹⁰ This explanation may be partially correct, but it cannot be the only explanation for at least three reasons. First, the reaction times were measured at the onset of each word, before the subjects reached the infinitival ending. Second, other word classes also have morphologically identifiable surface features; in particular, the citation form of adjectives is always the masculine nominative, with the ending *-Vj*. The availability of this generalization had no effect on the comprehension of adjectives, however. Third and most important, morphological identifiability cannot assist in translating lexical items; this hypothesis therefore fails to explain the data in Table 3, where the incomplete learners translated a higher proportion of verbs than nouns accurately, across all frequency ranges. This means that they actually *knew* the meaning of the verbs they were asked to translate.

An additional reason for improved performance on verbs is the size of the class and its frequency distribution. Nouns constitute about 48% of the Russian lexicon, verbs, about 18% (Anatoly Shaikevich, pers. comm.). In the mid-frequency range used here (1,500–4,000), there are 1,013 nouns and 821 verbs. Nouns are thus a more typical instance of an open class, and open classes tend to have a large number of members in the mid- and low-frequency ranges. If this is the case, the 22 nouns from mid- and low-frequency range selected for this study must 'compete' with a larger number of

⁹ The experiments used citation forms that are standard for monolingual/uninterrupted speakers of Russian: the infinitive for verbs, the nominative singular for nouns, and the masculine singular (nominative) for adjectives. Incomplete learners understand these citation forms but rarely use them in production tasks. For verbs, they use either imperative or past tense; for nouns, they use a variety of case forms, and for adjectives, non-masculine forms (Polinsky, 1995).

¹⁰ The Russian situation is the opposite of what is found in Hebrew, where verbs 'do not have any clear unequivocal . . . citation form' (Berman, 1988: 59); Berman suggests that this may be one of the factors impeding Hebrew-speaking children's acquisition of the verb class.

other mid- and low-frequency nouns. The number of mid- and low-frequency verbs is smaller, lowering the degree of “competition” and potentially accounting for higher verbal retention. However, the difference is not as dramatic as one would expect (1,023 vs. 821). Even if the numbers were more different, for this explanation to work nouns and verbs have to be stored differently in the brain—a reasonable but not yet fully proven assumption.

Now let us consider two additional explanations. Recall the developmental profiles of the incomplete learners surveyed in this study. They all started out as monolingual Russian speakers whose acquisition of Russian was interrupted around age 5. By that age, the noun bias observed in early acquisition across a number of languages seems to disappear. Thus, we might hypothesize that the incomplete learners’ starting point was a grammar with a roughly equal representation of verbs and nouns. In their end state, they either lose more nouns than verbs or fail to acquire nouns in sufficiently large numbers. The explanation then must address the question of *what forces an incomplete learner to keep more verbs than nouns*.

I would like to propose that it is less ‘costly’ for an incomplete learner to lose a noun than it is to lose a verb. The reason regards the syntactic function and conceptual density of verbs. Syntactically, verbs typically function as predicate heads. In both production and comprehension, the head is more important than its dependents. The overall processing of a clause is head-driven, and access to the head is crucial to the parser’s success. If the predicate cannot be recovered (or produced), the comprehension/production of the rest of the clause is in jeopardy. A problem with this explanation is that adjectives, a category in which the incomplete learners fared poorly, can function as predicate heads as well. This was the case even for the more frequent adjectives, which ostensibly have a better chance of assuming a predicate function. I don’t have a solution to this paradox, for the syntactic function is only a partial explanation.

The main explanation for the improved performance on verbs is their conceptual complexity, noted by a number of researchers (Gentner, 1981; Langacker, 1987; Markman, 1989). Conceptual density comprises a number of parameters. First, the underlying structure of verbs is more complex than that of many (but not all) nouns because verbal structure includes information on the predicate and its arguments. This is the basis of the so-called relational meaning associated with verbal semantics.¹¹ Next, verbs refer to events, which are less static than entities and can involve more complex semantics. If a noun is inaccessible, one can use a deictic (*that*), a generic place-holder (*that thing, the thing*), or a paraphrase. As a corollary, verbs are characterized by what Gentner calls ‘differential compositional latitude’: since there are many ways to describe one event, “there is more variation in the way in which languages conflate relational components into the meaning of . . . predicates” (Gentner, 1981: 169). Inaccessible verbs are very difficult to replace with generic place-holders; hence, the loss of information associated with those verbs is quite costly. This again argues for incomplete speakers to retain verbs over nouns.

¹¹ Some nouns have relational meanings too, most notably kinship terms; importantly, many of those terms are of very high frequency which may facilitate their acquisition and retention.

Another reason relates to the breadth of meaning associated with verbs. Verbs and nouns differ in that the semantics associated with a verb (or another relational term) is “more likely to be altered to fit the context than the semantic structure” associated with an object-reference term (Gentner, 1981: 168). Such elasticity of verb meanings allows speakers to use one and the same verb in a large number of contexts, typically larger than the number of contexts possible for a noun. This again argues that the loss of a verb is harder to compensate for than the loss of a noun. Overall, conceptual complexity relies on the fundamental representational differences which apply at the perceptual level and at the level of abstract reasoning. It can actually account for asymmetries observed in the linguistic representation of adults whose language continued to form beyond early acquisition. Incomplete learners’ treatment of nouns and verbs may follow from the profound asymmetry between object terms and relational terms, one which cuts across different languages and different mental domains.

Ultimately, the ability of a lexical item to function as a predicate and the lexical item’s conceptual complexity may form a unified account for what I have called the “verb bias.” At this point, the explanation for the bias demonstrated by incomplete learners is speculative and certainly requires further research. If this explanation is on the right track, it makes at least one specific prediction: namely, that the verb bias should not be found in incomplete learners whose acquisition was interrupted very early (under age 3), because these learners presumably did not have a chance to acquire a sufficient number of verbs. This requires further testing.

SUMMARY

We have discussed a comprehension experiment designed to compare incomplete and uninterrupted first language learners’ knowledge of word classes. In the experiment, the subjects responded to a sample of verbs, nouns and adjectives across three frequency ranges. The goal was to determine whether or not adult speakers show selective control of word classes and to establish the role (if any) of frequency in their knowledge of word classes.

Uninterrupted learners showed no specific bias in any of the word classes; a slight increase in reaction times occurred as the frequency of lexical items decreased, but this increase was rather small and did not correlate with any particular word class. Incomplete adult learners, on the other hand, displayed significant differences in response to nouns, verbs, and adjectives. The differences in word class were stronger than frequency differences; the latter played only a marginal role within each word class. The difference in response to the word classes examined here suggests that an incomplete grammar has word class representations. Incomplete learners performed rather poorly on adjectives, which may be due to the optionality of adjectives as a lexical class and their intermediate position between nouns and verbs. The results obtained for adjectives are quite similar to the results on adjectives in uninterrupted acquisition, where they tend to be acquired late and play less of a role in the architecture of grammar than other core contentive categories. In addition, the distribution of adjectives varies across styles and registers: adjectives are more common in literary language. The poor

performance of incomplete learners may be related to a lack of familiarity with this register.

The most striking finding is that the incomplete learners show a significant verb bias: the overall comprehension of verbs is stronger than that of nouns. This is evident from the response time measures and the number of accurate translations. At first glance, such verb bias seems to contradict the noun bias often cited in the literature. However, the findings on noun bias are based on production in young uninterrupted acquirers (under age 2;6), not on comprehension in older learners. There is no direct evidence of verb or noun bias in older children, which suggests that the verb bias in incomplete learners is not due to fossilization. The tentative explanation for the verb bias observed here relies on representational differences between nouns and verbs. In particular, incomplete learners maintain verbs more consistently because their loss is 'costlier' than the loss of nouns. Verbs also have greater conceptual complexity than nouns and often play the role of clausal heads, which is crucial to processing. These details support the need to maintain verbs.

Selective control of word classes has previously been reported in a number of populations including young children and brain-damaged patients (who show a range of variation in their biases). Healthy incomplete learners represent an additional population that exhibits selective control. The biases observed across these groups currently have different explanations. Further work will be needed to determine whether a unified explanation of such biases is possible. The first stage in this process will be additional studies on adult uninterrupted learners and older child learners across the world's languages.

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