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THE ROLE OF GRAMMATICAL GENDER IN THE ACQUISITION OF NOUN INFLECTION IN POLISH*

This paper considers the role that grammatical gender may play in the acquisition of noun inflection in Polish. The following alternatives were formulated: 1) the division of nouns into separate gender classes is a result of the acquisition of their inflections; 2) distinct gender classes already exist from the onset of the acquisition of the declensional system. Moreover, two possible gender divisions were compared: the traditional threefold division into masculine, feminine and neuter, and a contemporary formal one proposing a subdivision of masculine class. Consequently, three hypotheses were formulated: 1) five separate gender classes are crucial for the acquisition of the declensional system; 2) three separate gender classes are crucial for the acquisition; 3) separate gender classes emerge only as a result of the acquisition of noun inflection. Each hypothesis predicts different relative difficulties in acquiring declensional suffixes. In an attempt to test the hypotheses, a preliminary analysis of naturalistic data from Weist's corpus was conducted. It consisted in a cross-sectional comparison of the productivity of selected suffixes. The results suggest that gender classes are available from the onset. However, the number of gender classes is not the same for all children.

Introduction

There are seven grammatical cases in Polish, in both singular and plural. For the majority of nouns this means up to fourteen different inflections. Many of them may be formed with more than one suffix and the proper choice of a suffix is subject to various criteria to be fulfilled by a noun. Adding to this a number of stem alterations and irregularities results in an extremely complex system, one particularly difficult for foreign students (Łuczyński, 2002). At the same time

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Table 1. Distribution of declensional suffixes resulting in three separate gender classes

		Masculine	Neuter	Feminine
Sing	GEN	-a/-u	-a	-y(-i)
	DAT	-owi/-u	-u	-'e/-y(-i)
	ACC	-a/=NOM	=NOM	-e/=NOM
	INST		-em	-ą
	LOC		-'e/-u	-'e/-y(-i)
Pl	NOM	-owie/-i(-y)/-y(-i)/-e	-a	-y(-i)/-e
	GEN	-ów/-y(-i)	∅	∅/-y(-i)
	DAT		-om	
	ACC	-ów/-y(-i) / -e	-a	-y(-i)/-e
	INST		-ami	
	LOC		-ach	

acquisition of this system by Polish children appears strikingly fast and relatively error-free (especially when compared to a related language, e.g., Russian; Smoczyńska, 1985). Most of the suffixes are properly used from their very first appearance and Smoczyńska links this fact with the precocious acquisition of gender distinctions.

Grammatical gender is considered to be an essential, primary criterion for selection of a case suffix (Grzegorzczkova, Laskowski, & Wróbel, 1998). For each gender class there is a different set of declensional suffixes and different determinants for the selection of the correct one. The determinants may be morphophonological (depending on the formal structure of the stem) or semantic (depending on such oppositions as +/- *animacy*, +/- *human*), and for some cases in the masculine gender class it is impossible to identify any coherent determinant (suffixes in these cases are said to be determined customarily; Klemensiewicz, 1952). Assuming the traditional distinction of three gender classes: masculine, neuter and feminine, Table 1 presents a simplified distribution of declensional suffixes in Polish.

The table does not include the vocative case which was excluded from the analysis (following Smoczyńska, 1972), given its distinct communicative function (vocative does not form a part of syntax), limited set of referents, and the fact that it is often substituted with nominative forms in contemporary Polish (cf. Łuczyński, 2002). The table also lacks the nominative singular, as this is a starting point rather than part of the declension (although there are some suffixes typical for this case, they are not determined by the system). For the same reason, whenever an accusative singular form is equal to the nominative one, there is a =NOM symbol instead of a list of possible nominative suffixes. The symbol should be treated as denoting one 'logical' suffix rather than several competing ones. According to Smoczyńska (1972), formally determined suffixes are easier to acquire

Table 2. Distribution of declensional suffixes resulting in five separate gender classes (a shadowed cell indicates that both adjacent cells are parts of the same one)

		Masc. human	Masc. anim.	Masc. inanim.	Neuter	Feminine
Sing	GEN	-a		-a/-u	-a	-y (-i)
	DAT		-owi/-u		-u	-’e/-y (-i)
	ACC	-a			=NOM	-e/=NOM
	INST			-em		-ą
	LOC			-’e/-u		-’e/-y (-i)
Pl	NOM	-owie/-i(-y)/-e		-y (-i)/-e	-a	-y (-i)/-e
	GEN		-ów/-y (-i)		∅	∅/-y (-i)
	DAT			-om		
	ACC	-ów/-y (-i)		-y (-i)/-e	-a	-y (-i)/-e
	INST			-ami		
	LOC			-ach		

than those determined semantically or customarily. Hence the latter are marked in the table with bold font.

It may be assumed that Polish children’s acquisition of the declensional system is based on gender distinctions. For a given case different suffixes appear simultaneously and from the onset they are used with a proper gender class of nouns. The only example of a systematic error is overgeneralization of *-ów* suffix in genitive plural (see Dąbrowska, 2001), whereas in Russian so-called *inflectional imperialism* – consisting in overgeneralization of the most frequent suffix for a given case to all nouns – is widespread (Smoczyńska, 1985). Therefore one may claim that a newly acquired suffix is immediately assigned to an appropriate gender class or – in other words – for every gender class a distinct set of suffixes is created from the onset. However, there are two main problems with this statement.

The number of gender classes

The first one concerns the actual number of gender classes. Traditionally, three classes have been distinguished: masculine, neuter and feminine. This view, albeit intuitively plausible, lacks a consistent definition of gender distinctions. Morphologically, there are some nominative singular suffixes associated with each class (\emptyset with masculine, *-a* with feminine, and *-o* with neuter) but these are prototypical for the classes rather than their distinctive features. Semantically, there is no motivation for such gender distinctions, except for a set of nouns referring to human beings and a limited set referring to domestic animals. Thus syntactic criteria have been investigated by linguists and eventually five gender classes have

been proposed. The new set of gender classes is a result of splitting the masculine class into three subclasses: human, animate, and inanimate. Table 2 shows distribution of declensional suffixes consistent with the contemporary view.

The new division, though widely accepted by descriptive linguists (e.g., Grzegorzycykowa et al., 1998; Nagórko, 1996), is apparently not acknowledged in the field of language acquisition (e.g., Łuczyński, 2002; Smoczyńska, 1972). However, it should be noted that it provides a more consistent description of noun inflection (there are fewer non-formal determinants and hence some suffixes in Table 2 are no longer bolded as compared to Table 1). Also, it better accommodates syntactic patterns and – which seems especially important from the developmental point of view – the distinction of human, animate and inanimate is to a large extent (with a few exceptions) semantically driven.

On the other hand, the traditional threefold division seems to be superior and may be more salient for children in the course of language acquisition. Two facts support this claim. Firstly, unlike the contemporary subdivision of masculine nouns, the traditional distinction is global, i.e., every noun must be masculine, feminine or neuter, whereas only masculine nouns are to be divided into human, animate and inanimate. Secondly, each gender class (in the traditional division) has its own typical suffix(es), which within the masculine class, happens to be the same whether a noun is human, animate or inanimate. Due to many irregularities, these suffixes cannot be considered a criterion for gender distinctions (hence the formal, five class distinction based on syntactic properties). Nevertheless, being prototypical they may facilitate the emergence of masculine, feminine and neuter classes (e.g., Schlesinger, 1994, for a review of the emergence of grammatical constructs as prototypical categories). Therefore, if one claims that the acquisition of noun inflection proceeds separately for each gender class, one has to answer the question how many gender classes are already available to a child.

The origin of gender classes

The second problem with this claim is more serious. It consists in the question of whether we may credit children with separate gender classes before they start acquiring any noun inflections whatsoever. There are two manifestations of grammatical gender in Polish: declensional patterns and agreement of adjectives, past tense verbs, pronouns, etc. Of these the latter (agreement) is obviously secondary. One knows that an adjective or past tense verb requires a particular form because of a distinctive feature of the noun it goes with. Yet this distinctive feature is revealed only in the declensional pattern of the noun. Similarly, a child may distinguish nouns according to the nominative singular suffix they take (prototypical for the three basic gender classes), but only while acquiring noun inflection can the child apprehend the significance of such a distinction.

Table 3. Distribution of declensional suffixes resulting in no separate gender classes

Sing	GEN	Masc.hum., anim., Neut.: -a	Masc.inanim.: -a/-u	Fem.: -y (-i)
	DAT	Masc.: -owi/-u	Neut.: -u	Fem.: - ³ e/-y (-i)
	ACC	Masc.hum., anim.: -a	Masc.inanim., Neut.: =M	Fem.: -e/=M
	INST	Non-Fem.: -em	Fem.: -a	
	LOC	Non-Fem.: - ³ e/-u	Fem.: - ³ e/-y (-i)	
	Pl	NOM	Masc.hum.: -owie/-i(-y)/-e	Masc.anim., inanim., Fem.: -y (-i)/-e
GEN		Masc.: -ów/-y (-i)	Neut.: ∅	Fem.: ∅/-y (-i)
DAT			-om	
ACC		Masc.human.: -ów/-y (-i)	Masc.anim., inanim, Fem.: -y (-i)/-e	Neut.: -a
INST			-ami	
LOC			-ach	

On the other hand, sensitivity to gender oppositions is certainly crucial for the acquisition of the declensional system. However, it does not necessarily require grouping nouns into separate classes. Indeed, it is worth noting (in Table 1 and especially in Table 2) that whatever the number of assumed gender classes (three or five) for individual cases only a few distinctions matter and for different cases different distinctions may be significant. For example, in instrumental and locative singular the significant opposition is between feminine and non-feminine, which means that if one assumes five distinct classes as many as four of them share the same suffixes for these cases (Table 2). Also, accusative plural feminine nouns have the same suffixes as masculine animate and inanimate whereas masculine human as well as neuter have different ones.

Thus, it is quite possible that children acquiring a given case identify the gender distinctions relevant for it and only subsequently – observing similarities between different cases – generalize these distinctions to form gender classes. In such a case Table 3 properly illustrates the distribution of suffixes. In this table there is no fixed number of columns and every cell is given an equal width to reflect the fact that no global divisions are imposed on the distribution of suffixes for a given case. It should be emphasized that, if gender classes are available prior to the acquisition of noun inflection in some other way, they are either innate or acquired externally to the linguistic system (possibly reflecting some general cognitive categorization).

Table 4. Predictions

Hypothesis	Sing			Pl
	ACC	INST	LOC	ACC
1	-a > -ę =NOM > -ę	-em > -ą	-'e > -u > -y(i)	-e > -ów -a > -ów
2	-ę > -a =NOM > -a	-em > -ą	-'e > -u > -y(i)	-y(i), -e > -ów -a > -ów
3	-a > -ę =NOM > -ę	-em, -ą	-'e > -u, -y(i)	-a > -e, -ów
Diagnostic value	1=3≠2	1=2≠3	1=2≠3	1≠2≠3

Hypotheses

To conclude, when one claims that grammatical gender plays a crucial role in the acquisition of the declensional system one must investigate whether distinct gender classes are available from the outset and if so how many of them there are. Consequently three hypotheses may be formulated:

1. From the beginning nouns are divided into five classes and within each of them different sets of suffixes (accompanied by different determinants when two or more suffixes are available) are created.
2. From the beginning nouns are divided into three traditional classes. In this case some distinctions between human, animate and inanimate occur only as local determinants for some cases within the masculine class.
3. The process of acquisition of noun inflection is common to all nouns, and different gender distinctions occur only as local determinants for individual cases.

Method

In order to test these hypotheses three factors facilitating acquisition of a suffix in a given case are proposed:

- a) lack of other suffixes competing with the given one;
- b) lack of non-formal determinants if there are competing suffixes;
- c) the number of different classes in which a given suffix occurs.

The first two factors are supported by the findings of Smoczyńska (1972). There is no support for the third one but its assumption seems psychologically reasonable. It is possible – considering the three factors – to predict the relative ease of acquiring different suffixes in four cases: accusative, instrumental and locative singular, and accusative plural (Table 4). Some of the predictions remain

the same irrespective of the assumed hypothesis. This should be treated as a control measure of the proposed procedure. At the same time some predictions are affected by the assumed hypothesis and this fact enables testing the hypotheses.

Relative ease of suffixes was estimated by the productivity of their usage in a corpus of naturalistic data from four children at an age typical for the acquisition of noun inflection (Łuczyński, 2002; Smoczyńska, 1985). Productivity was counted as the ratio of the number of noun types occurring with a given suffix and with at least one other inflection to the total number of noun types occurring with a given suffix (P1). This method resembles the one employed by Pine, Lieven, & Rowland (1998). However, since there are seven cases in two numbers in Polish and it is quite possible for a noun to be rote-learned in two different inflections, a second index of productivity was introduced (P2). This one was thought of as more conservative, for it takes into account noun types occurring in at least two (not just one) different inflections in addition to the one analyzed. An index was assumed to indicate productive usage of a given suffix by a child if the Fisher's Exact Test calculated for it was significant.

The data used in this study were collected, transcribed and coded by Weist and his colleagues (Weist, Wysocka, Witkowska-Stadnik, Buczowska, & Konieczna, 1984) and obtained through the CHILDES system (MacWhinney, 2000). Although the corpus included some morphological coding it was not sufficiently consistent and required some correction and – first of all – standardization. All noun forms incompatible with the adult language or problematic were excluded, as were also all songs, poems etc., and immediate imitations. Child-invented words were included providing they were used and inflected consistently.

For every noun included in the analysis the suffixes it takes in the four investigated cases were coded. As some masculine nouns may behave as animate and inanimate (thus varying in the accusative form they take), they were excluded from the analysis of accusative suffixes unless there was evidence the child used them with one particular suffix consistently.

Table 5. Basic information about the corpus

	Age	MLUw	Total number of utterances	Number of noun types included in analysis	Number of noun inflection types included in analysis	Number of erroneous noun inflection types excluded
Bartosz	1;7-1;11	1,746	1588	148	217	29
Marta	1;7-1;10	1,972	1851	325	492	17
Kubuś	2;1-2;6	2,647	1311	233	371	28
Wawrzon	2;2-2;6	2,289	1670	277	395	18

Results

Table 5 presents the basic information about the corpus and Tables 6-8 present productivity rates for the different suffixes in three of the analyzed grammatical cases. The frequencies for accusative plural were too low to provide any results. For the same reason Table 7 and 8 do not include the results of the Bartosz data.

Table 6. Accusative singular (bold indicates $p < 0.05$)

	<i>-a</i>		=NOM		<i>-ę</i>	
	P1	P2	P1	P2	P1	P2
Bartosz	7/11	3/11	11/15	1/15	11/21	6/21
Marta	10/12	8/12	27/47	14/47	19/34	5/34
Kubuś	9/13	6/13	21/45	12/45	14/35	7/35
Wawrzon	5/7	3/7	21/46	8/46	21/36	8/36

Table 7. Instrumental singular (bold indicates $p < 0.05$)

	<i>-em</i>		<i>-ą</i>	
	P1	P2	P1	P2
Marta	8/13	6/13	10/12	4/12
Kubuś	15/22	10/22	7/9	6/9
Wawrzon	11/16	7/16	4/8	4/8

Table 8. Locative singular (bold indicates $p < 0.05$)

	<i>-e</i>		<i>-u</i>		<i>-y(i)</i>	
	P1	P2	P1	P2	P1	P2
Marta	17/26	6/26	11/18	9/18	2/5	0/5
Kubuś	11/14	2/14	9/14	5/14	2/5	0/5
Wawrzon	9/19	3/19	5/9	2/9	2/5	0/5

The advantage of employing two indices of productivity (P1 and P2) can be seen, since it enabled finer comparisons as there were three possible levels: both significant, only one significant, none significant. Moreover P2, though indeed more conservative in general, appeared in some cases the only significant index. This is due to the fact that the overall frequency of nouns occurring in at least three different inflections is much lower than that of nouns occurring in at least two different inflections, and this counterbalances the conservativeness caused by the smaller values of the numerator in P2.

The results for Bartosz obtained from the analysis of accusative singular support hypothesis 2, falsifying hypotheses 1 and 3. However, as there are no results for the other cases, the support for hypothesis 2 is somewhat unreliable.

As for Marta and Kubuś, the data from accusative singular falsify hypothesis 2 and data from locative support both hypotheses 1 and 2. The data from the instrumental are inconclusive, since both suffixes appear to be already fully productive so it is impossible to tell the difference in their ease of learning. Nonetheless, combining results from accusative and locative gives support to hypothesis 1.

The only conclusive results for Wawrzon come from the instrumental and falsify hypothesis 3. It is worth noting, however, that in the accusative, despite very low frequency of forms ending with *-a*, productivity rates are not unequal to those of *-em* forms. This provides weak support for hypotheses 1 and 3. Hence to some extent it may be said that this hypothesis is supported with the Wawrzon data.

Finally, it should be appreciated that no data contradicted the predictions common to all hypotheses treated as a control measure. In the instrumental, apparently no child found the *-a* suffix easier than *-em*, which would have contradicted the procedure. Similarly in locative, according to common predictions *-e* suffix should be the easiest, and the data do not falsify this prediction.

Conclusions

In the end it must be stated clearly that this study is treated as a preliminary analysis only. It should be replicated on a larger corpus which would enable longitudinal analysis. Only the investigation of developmental change in productive usage of declensional suffixes would reveal unquestionable differences in their relative ease of learning. However, supposing the current results are fully reliable, there are two interesting points. First, confirmation of different hypotheses for different children would indicate that the acquisition of the declensional system depends to a large extent on individual differences and possibly on varying input rather than on innate constraints. Second, the results suggest that some (though different for different children) gender classes are available from the onset of the acquisition of noun inflection. This would mean that the issue of the nature of grammatical gender remains to be settled.

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