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GRAMMATICAL GENDER, SYMBOLIC MEANING, AND GENDER CONCEPT: RECALL, CLASSIFICATION, AND PREFERENCE TESTS

ABRAHAM SAGI
The University of Haifa

It was hypothesized that Hebrew-speaking participants would be influenced by the assumed connotation more than by the grammatical gender of Hebrew stimulus words in recall, classification, and preference tests. Participants were 24 Israeli kindergarteners and 24 Israeli college students. Apart from a few exceptions, the participants performed as predicted, responding to meaning rather than to grammar. Similar results have been obtained in previous studies testing English-speaking populations. The findings suggest that grammatical gender plays a role only in tasks with a higher level of cognitive complexity, such as memory tasks.

Keywords: grammatical gender, symbolic meaning, connotation, memory, gender concept, linguistic structure, Hebrew language.

The relationship between linguistic structure and personality variables has been the subject of inquiry and discussion in recent years (Guiora et al., 1975). Paluszny et al. (1973) asked if the degree of gender loading in one's native language influences the timing of the attainment of gender identity.

The concept of *gender loading* refers to the fact that languages differ in the extent to which they employ gender-determined grammatical cues. For example, in English the pronouns "he" and "she" are used to distinguish between male and female, but adjectives and verbs are identical for both genders (e.g., "good boy," "good girl," "she goes," "he goes"). In the

Abraham Sagi, School of Social Work, University of Haifa.
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Correspondence concerning this article should be addressed to Abraham Sagi, School of Social Work, University of Haifa, Haifa 31999, Israel.

Finnish language, the pronouns “he” and “she” do not exist, and the same term is used for both male and female. In Hebrew, on the other hand, almost all components of the language have grammatical gender marking: nouns, adjectives, verbs, and most pronouns. Thus, languages can be hierarchically ordered in terms of their gender loading. Finnish would be at one extreme of the continuum (zero gender loading), English would be higher than Finnish but still low on the continuum, and Hebrew would approach the other extreme of the continuum (maximum gender loading).

Paluszny et al. (1973) queried whether the attainment of gender identity by toddlers might be related to these grammatical differences. Using the Michigan Gender Identity Test (MIGIT; Dull, Catford, Guiora, & Beit-Hallahmi, 1975) Paluszny et al. found that Israeli children were able to classify pictures of children according to gender earlier than their American counterparts.

The prevalence of gender-determined grammatical cues in different languages can be discussed in terms of the acquired distinctiveness of cues (ADC) and acquired equivalence of cues (AEC; Dollard & Miller, 1950; Katz, 1963, 1973a, 1973b; Katz, Albert, & Atkins, 1971; Katz & Seavey, 1973). The ADC hypothesis suggests that highly distinctive names being associated with similar stimuli makes the total stimulus complex (stimulus + name) more distinctive, whereas the AEC hypothesis suggest that if the same or similar names are associated with different stimuli, a total stimulus complex results for each name–stimulus combination, and all these stimulus complexes are similar to each other.

Finnish and English have equivalent cues in relation to gender marking, whereas Hebrew has distinctive cues. Further, the development of gender identity is, at least in part, a cognitive process requiring perceptual and discrimination learning. Linguistic factors may influence the developmental processes that enable the child to distinguish between males and females and to classify them into categories. This would account for the superior performance of Israeli participants on the MIGIT.

To test this speculation, Sagi (1979a, 1979b) attempted to simulate experimentally the linguistic process that is assumed to have some bearing on the development of gender discrimination. It was found that linguistic codes do play a role in the way children organize perceptual information in terms of gender and that the ADC and AEC hypotheses are partially valid in this context. Furthermore, arbitrary verbal cues have diminishing effects with increasing age; that is, children in the first grade are still influenced by initial exposure to verbal cues, but as soon as they find out that other, more relevant cues are available for discrimination, verbal cues lose their impact. Younger children, such as those in the Paluszny et al. (1973) study, tend to take any cue for granted. The distinctive grammatical cues

in Hebrew, therefore, speed up the attainment of ability to classify gender as measured by the MIGIT.

Guiora, Beit-Hallahmi, and Sagi (1980) examined if the grammatical gender assigned by one's native language influences the way in which male and female characteristics are ascribed to essentially agendered objects. A semantic differential test composed of a masculine–feminine scale and 30 stimulus words (in neutral, consonant, and dissonant sets) was administered, in English, to 95 American college students and, in Hebrew translation, to 95 college students in Israel. Each set contained the English equivalent of five masculine (in Hebrew) and five feminine (in Hebrew) nouns. The neutral set, following the so-called Whorfian hypothesis (Whorf, 1956), was not supported by Guiora et al., suggesting the communality of symbols at least across these two languages and cultures. Words with a grammatical gender (again in Hebrew) appeared to be at variance with their gender connotation. The Israeli students were not influenced by the grammatical gender but assigned gender connotation to the test words exactly as did the Americans.

Guiora and Sagi (1978) observed that 5-year-old Israeli children were guided by the assumed gender connotation of the words, not by grammatical gender. Neither adults nor children are influenced by constant exposure to gender markings and their assumed residual associative influence, instead assigning meaning to words as if they represent cultural universals. This conclusion is, however, based on a classification test. Nadelman (1970, 1974) has shown that both girls and boys demonstrate an understanding of gender-typing by the age of 5 and that they recall better and prefer same-gender items.

The following question was raised in the present study: how do Israeli participants classify, recall, and rank in order of preference items with a grammatical gender that is congruent or incongruent with their assumed connotative meaning? As noted above, very young children are influenced by the structure of language (Paluszny et al., 1973). Thus, we hypothesized that the impact of grammatical gender would be minimized by the time the child reaches 5 years of age. The performance of Israeli participants was, therefore, expected to resemble that of English-speaking participants, even when the grammatical gender of a stimulus is at odds with its psychological–cultural connotation.

Method

Participants

Twenty-four Israeli kindergarteners and 24 Israeli college students were tested individually. Males and females were equally represented. Hebrew was the native language of all participants.

Stimuli

For the adult group, there were 24 stimulus words, arranged in three pairs of sets (Guiora & Sagi, 1978) termed neutral, consonant, and dissonant. The stimulus words were as follows:

Neutral:	(M)	Clock, Book, Table, Chair
	(F)	Teaspoon, Lamp, Bed, Toothbrush
Consonant:	(M)	Aircraft, Tank, Gun, Hammer
	(F)	Doll, Skirt, Dress, Braid
Dissonant:	(M)	Earring, Apron, Broom, Iron
	(F)	Truck, Submarine, Bow, Necktie

It was ascertained that the kindergarteners were familiar with these objects and could label them correctly.

Memory Task

Because the same stimuli were employed in all tasks, the memory test was administered first to eliminate practice effects. The participant was instructed to remember as many items as possible, before being shown each of the 24 randomly ordered drawings for 3 seconds, with a 1-second interval between presentations.

Classification Test

The college students' perception of the stimuli was tested by means of a three-category scale: male, female, and neutral. They were asked to place the stimulus words in one of these categories.

For the kindergarteners, a variant of the technique was developed in the form of a simple sorting task. Line drawings of a girl and a boy (subsequently identified as Ruthi and Coby) on 17 × 25 cm white cards, were placed in front of the child, about 15 cm apart and at about an arm's length from the participant. The child was then asked to place each of 24 pictures in front of either Ruthi or Coby, making the decision "according to whether the object in the drawing belongs to, or goes best with, Ruthi and her mother (female) or Coby and his father (male)." If the child thought a picture belonged to both Ruth and Coby (neutral) s/he was asked to hand the card to the experimenter.

Preference Task

Only kindergarteners were tested, owing to the childish nature of this task. The task comprised three stages, one for each set of eight cards. The order of presentation of the three sets was determined randomly,

although each combination was presented to an equal number of males and females.

The eight cards in the first set were spread out on a table. The child was asked to select and hand to the experimenter the item s/he liked the most. Then s/he was asked to look at the remaining cards and choose the item s/he now liked best. A further two selections were carried out (total of four). Upon completion of the first set, the procedure was repeated with the second and third sets.

Results and Discussion

Memory Task

A three-way analysis of variance (ANOVA; age × gender × stimuli) with repeated measures on the last factor yielded significant effects of age, $F(1, 44) = 87.16$, $p < .001$, and stimuli, $F(5, 220) = 6.06$, $p < .01$. The age effect is self-evident and, in any case was not a major finding in the present study, but differences between the stimuli were not expected. The mean scores for neutral–masculine, neutral–feminine, consonant–masculine, consonant–feminine, dissonant–masculine, and dissonant–feminine were 1.65, 1.46, 1.56, 2.25, 1.35, and 1.46, respectively. A Newman–Keuls test for individual comparisons (Winer, Brown, & Michels, 1971) resulted in significant differences (ps < .05) between consonant–feminine and each of the stimuli groups. None of the comparisons between the other groups was significant.

The preference task results indicate that none of the stimulus groups appeared to be more attractive than the others, although only the kindergarten group completed this task. Thus, attractiveness does not seem to account for the significantly higher score on the consonant–feminine items. No explanation is available, at present, for this result.

The ANOVA also yielded a significant interaction, $F(5, 220) = 2.78$, $p < .05$, between gender and stimuli (Table 1), as expected. Further Newman–Keuls individual comparisons revealed the following trends for female participants.

Table 1. *Recall Scores According to Gender and Stimuli*

	Neutral–Masculine	**Neutral–Feminine**	**Consonant–Masculine**
Males	1.67	1.67	2.00
Females	1.63	1.25	1.25
	Consonant–Feminine	**Dissonant–Masculine**	**Dissonant–Feminine**
Males	2.50	1.38	1.54
Females	2.25	1.33	1.38

The difference between the means of neutral-masculine and neutral-feminine items was not significant, indicating that the assumed connotations underlying both groups of stimuli are indeed similar, with no grammatical gender effect.

Female participants remembered consonant–feminine items better than consonant–masculine, $F(1, 220) = 18.30$, $p < .05$. This fits the expectation that same-gender items would be better recalled. Consonant–feminine stimuli were also better recalled than neutral–feminine, $F(1, 220) = 4.92$, $p < .05$, suggesting a recall of same-gender items according to connotation rather than grammatical gender. The recall of consonant–feminine stimuli was superior to that of dissonant–feminine, $F(1, 220) = p < .05$. If the dissonant–masculine items were perceived on the basis of connotation rather than grammatical gender, no differences would have been expected between consonant–feminine and dissonant–masculine. This was not, however, the case, $F(1, 220) = 11.07$, $p < .05$. The general tendency in this study toward better recall of consonant–feminine items may have contributed to this result.

Higher scores would be expected on dissonant–masculine items than on dissonant–feminine if the assumed gender connotation had a strong impact. In fact, no difference was found. It is possible that some interference was caused by the grammatical gender factor, and this may also be an alternative explanation for the difference between consonant–feminine and dissonant–masculine scores. That is, in addition to a tendency toward superior recall of consonant–feminine items, the structure of the dissonant–masculine stimuli is more complex precisely because of the dissonance, and these items may, therefore, be more difficult to recall.

According to Nadelman (1970, 1974) both males and females are expected to demonstrate better recall of same-gender items. Males in this study, however, recalled the consonant–masculine and consonant–feminine sets equally well. This may be due to the general inexplicable contribution of consonant–feminine in the general analysis. Nevertheless, for consonant–masculine items, the recall scores of males were better than those of females, $F(1, 220) = 7.35$, $p < .05$. Males recalled consonant–masculine stimuli better than dissonant–masculine, $F(1, 220) = 6.43$, $p < .05$, indicating superior performance based on assumed male connotation. Male participants remembered consonant–masculine items better than dissonant–feminine, $F(1, 220) = 5.65$, $p < .05$. As for females, it could be argued that the structure of consonant stimuli is less complex and that grammatical gender does, therefore, play a role.

Dissonant–masculine scores, as with female participants, did not differ from dissonant–feminine scores. Again, grammatical gender may have an impact on information processing.

Males recalled neutral–masculine and neutral–feminine items equally well, indicating that grammatical gender does not affect the process. These stimuli, however, may be less complex than those belonging to the dissonant sets, so that the potential impact of grammar is not visible.

The data discussed so far show that in a language with a complex gender structure, such as Hebrew, grammatical gender may play a role, particularly in tasks with some cognitive complexity, e.g., memory tasks.

A pragmatic conclusion is that Israelis do not differ substantially from English-speaking participants, and exhibit a similar trend towards better recall of same-gender items. A shift occurs in this trend when the stimulus becomes more complex, and the grammatical component then affects performance.

Table 2. *Chi-Square Test Results for Masculine, Feminine, and Neutral Words*

Word	**Masculine**	**Feminine**	**Neutral**	χ^2	***p***
Clock	8	2	38	46.50	.01
Table	7	0	41	60.13	.01
Book	3	4	41	58.63	.01
Chair	7	0	41	60.13	.01
Teaspoon	0	18	30	28.50	.01
Lamp	0	16	32	32.00	.01
Toothbrush	1	2	45	78.88	.01
Bed	0	7	41	60.13	.01
Tank	45	0	3	79.13	.01
Aircraft	39	0	9	52.13	.01
Gun	43	0	5	69.13	.01
Hammer	42	0	6	64.50	.01
Skirt	0	48	0	96.00	.01
Doll	0	44	4	74.00	.01
Dress	0	47	1	90.13	.01
Braid	0	48	0	96.00	.01
Necktie	38	5	5	45.38	.01
Submarine	33	4	10	22.08	.01
Truck	40	2	6	54.60	.01
Bow	31	3	14	24.88	.01
Apron	1	42	5	63.88	.01
Broom	8	22	18	6.50	.09
Earring	1	45	2	78.88	.01
Iron	6	28	14	15.50	.01

Note. $N = 48$ in all analyses except Submarine, where $N = 47$

If classification is made on either a strictly connotative or strictly grammatical basis, no effect should be produced by participants' age or gender, or the joint operation of these two factors. Independent three-way chi-square analyses (age × gender × classification), one for every stimulus word, showed for most stimuli nonsignificant effects of gender × classification and of age × gender × classification (see Tables 3 and 4). Significant gender × classification interactions were found for the stimulus words *book, necktie,* and *iron*. Book was classified by most males and females as neutral. Among those participants who deviated, males tended to classify it as masculine, and females as feminine. Necktie was perceived as masculine by the majority of both genders, but there was a tendency on the part of the males to classify it as feminine and neutral. Iron was classified as feminine by both male and female participants, but males classified it also as masculine. These exceptional interactions of gender with stimulus words are, nevertheless, in line with the general trend, namely, classification according to assumed connotation rather than grammatical gender.

For the stimulus words *Clock, Table, Book,* and *Broom*, there were significant interactions between age and stimulus word, with these stimuli generally perceived in terms of their assumed connotation. However, more adults than children deviated in the direction of perceiving Clock, Table, and Book as masculine in Hebrew, possibly owing to grammatical impact or misinterpretation of the experimental instructions. In some cases, the task may have been construed as an examination to test mastery of grammatical gender. Broom, which is assumed to have a female connotation while being masculine grammatically, was very clearly classified by children according to connotation, but more adults than children perceived it as neutral as well. It is possible that cleaning the home is becoming a more neutral task, such that Broom no longer has a distinctly female connotation. If so, adults are likely more aware of the shift than are children.

Preference Task

A two-way ANOVA (gender × stimuli) with repeated measures on the second factor indicated, as expected, an interaction effect, $F(5, 100) = 34.49$, $p < .001$. The means are presented in Table 5.

The trend is very clear: boys preferred the consonant–masculine and dissonant–feminine stimuli, and girls the consonant–feminine and dissonant–masculine items. This supports Nadelman's (1970, 1974) suggestion, and the preference in the dissonant group is based on the assumed connotation rather than grammatical gender.

Table 3. *Interaction Between Gender and Classification*

Item	Gender	*M*	*F*	*N*	χ^2	*p*	Item	Gender	*M*	*F*	*N*	χ^2	*p*
Clock	Female	2	2	20	4.10	*ns*	Skirt	Female	0	24	0	0.00	*ns*
	Male	6	0	18				Male	0	24	0		
Table	Female	1	0	23	4.16	*ns*	Doll	Female	0	21	3	1.08	*ns*
	Male	6	0	18				Male	0	23	1		
Book	Female	0	4	20	7.02	.05	Dress	Female	0	23	1	1.02	*ns*
	Male	3	0	21				Male	0	24	0		
Chair	Female	4	0	20	0.16	*ns*	Braid	Female	0	24	0	0.00	*ns*
	Male	3	0	21				Male	0	24	0		
Teaspoon	Female	0	10	14	0.34	*ns*	Necktie	Female	23	0	1	8.48	.05
	Male		8	16				Male	15	5	4		
Lamp	Female	0	7	17	0.36	*ns*	Submarine*	Female	19	3	2	5.88	*ns*
	Male	0	9	15				Male	14	1	8		
Toothbrush	Female	0	2	22	3.02	*ns*	Truck	Female	21	0	3	2.10	*ns*
	Male	1	0	23				Male	19	2	3		
Bed	Female	0	3	21	0.16	*ns*	Bow	Female	17	0	7	3.28	*ns*
	Male	0	4	20				Male	14	3	7		
Tank	Female	24	0	0	3.20	*ns*	Apron	Female	0	22	2	1.28	*ns*
	Male	21	0	3				Male	1	20	3		
Aircraft	Female	19	0	5	0.12	*ns*	Broom	Female	2	15	7	5.78	*ns*
	Male	20	0	4				Male	6	7	11		
Gun	Female	22	0	2	0.42	*ns*	Earring	Female	0	22	2	3.02	*ns*
	Male	21	0	3				Male	1	23	0		
Hammer	Female	21	0	3	0.00	*ns*	Iron	Female	0	17	7	7.08	.05
	Male	21	0	3				Male	6	11	7		

Note. M = Masculine, F = Feminine, N = Neutral. **N* = 47.

Table 4. *Interaction Between Age and Classification*

Item	Age	*M*	*F*	*N*	χ^2	*p*	Item	Age	*M*	*F*	*N*	χ^2	*p*
Clock	C	0	2	22	10.94	.01	Skirt	C	0	24	0	0.00	*ns*
	A	8	0	16				A	0	24	0		
Table	C	0	0	24	8.18	.05	Doll	C	0	23	1	1.08	*ns*
	A	7	0	17				A	0	21	3		
Book	C	0	4	20	7.02	.05	Dress	C	0	24	0	1.02	*ns*
	A	3	0	21				A	0	23	1		
Chair	C	2	0	22	1.48	*ns*	Braid	C	0	24	0	0.00	*ns*
	A	5	0	19				A	0	24	0		
Teaspoon	C	0	5	19	5.66	*ns*	Necktie	C	17	4	3	2.42	*ns*
	A	0	13	11				A	21	1	1		
Lamp	C	0	6	18	1.50	*ns*	Submarine*	C	15	2	6	0.64	*ns*
	A	0	10	14				A	18	2	4		
Toothbrush	C	1	20	21	3.20	*ns*	Truck	C	20	0	4	2.66	*ns*
	A	0	1	24				A	20	2	2		
Bed	C	0	6	23	4.16	*ns*	Bow	C	14	1	9	1.74	*ns*
	A	0	0	18				A	17	2	5		
Tank	C	22	0	2	0.34	*ns*	Apron	C	0	22	2	1.28	*ns*
	A	23	0	1				A	1	20	3		
Aircraft	C	19	0	5	0.12	*ns*	Broom	C	1	15	9	7.62	.05
	A	20	0	4				A	7	7	10		
Gun	C	22	0	2	0.22	*ns*	Earring	C	0	24	0	3.20	*ns*
	A	21	0	3				A	1	21	2		
Hammer	C	22	0	2	0.74	*ns*	Iron	C	1	17	6	4.22	*ns*
	A	20	0	4				A	5	11	8		

Note. M = Masculine, F = Feminine, N = Neutral, C = Children, A = Adults. **N* = 47.

Table 5. *Preference Scores According to Gender and Stimuli*

	Neutral–Masculine	Neutral–Feminine	Consonant–Masculine
Males	2.18	1.82	3.64
Females	1.91	2.09	0.82
	Consonant–Feminine	**Dissonant–Masculine**	**Dissonant–Feminine**
Males	0.36	1.09	2.91
Females	3.18	3.18	0.82

A Newman–Keuls test for individual comparisons between relevant pairs of means in the interaction table further clarified the findings. At $p < .05$, girls preferred dissonant–masculine and consonant–feminine items to those in other groups. No differences were found in preference for neutral–masculine vs. neutral–feminine, or consonant–feminine vs. dissonant–masculine items. The former nonsignificant comparison indicates the absence of a grammatical gender effect, whereas the latter again implies that connotative gender is more powerful than assigned grammatical gender. For the boys, an identical pattern of individual comparisons emerged, but with a preference for items with male connotations.

Conclusion

As suggested in previous studies (Guiora et al., 1975) regarding possible links between gender loading of language and the development of related aspects of gender, the memory, preference, and classification results indicate a general trend to perform according to meaning rather than grammar. In the memory task, there were some indications of an effect of grammar, which may manifest in tasks with a higher level of cognitive complexity.

For children under 3 years of age, gender loading in Hebrew words provides distinctive cues, thus speeding up attainment of the gender concept (Paluszny et al., 1973), but the continuing effects are secondary. By the age of 5 years, a child has a relatively good grasp of gender, such that grammatical cues have an impact only when the cognitive task is more complex. In general, however, the data indicate that, in the meaning–gender relationship, the universal human experience exerts a stronger influence than the constraints imposed by the structure of a particular language.

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