Sex Bias in Visual Images Evoked by Generics: A New Zealand Study[1]

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Male biases are known to exist in the usage, evaluation, and interpretation of masculine generics. This study explored, by means of a tachistoscope, sex-specific biases in visual images evoked by masculine ("All men are created equal," "At university a student can study whatever he wants") and feminine ("The feminists protested outside the town hall," "At university a student can study whatever she wants") generics. Photographs of male and female faces were presented in a deliberately ambiguous (subthreshold) viewing field while maintaining the masculine or feminine generic sentence on constant view. It was predicted and found in a sample of 48 university students that if generics invoked sex-specific images, the images would affect the direction in which the viewer would resolve the ambiguous faces, resulting in more reported male faces in the masculine than in the feminine generic condition.

In New Zealand, as in England and many other English-speaking nations, the grammatical proper generics for sex-indefinite referents are *he* and *man* rather than *she*, singular *they*, or *woman*. This heritage of a "father" language, itself a product of 19th-century Victorian mentality (Bodine, 1975), lingers in New Zealand, even though its decline has probably been taking place (see Cooper, 1984) and is certainly accelerated by the 1986 government decree to replace generic masculines in the law books by sex-neutral or more equitable terms.

Masculine generics (*he, man,* etc.) are also masculine-specific terms. One might expect that the teaching of grammer on the dual meaning of these

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terms would in due course lead to the proper differentiation of the generic meaning from the sex-specific meaning. Yet the generic meaning often shows the tendency of a male bias even in contexts intended to be gender neutral. For example, individuals restrict the use of masculine generics to male-related contexts only (Martyna, 1978), interpret them to be male specific (MacKay & Fulkerson, 1979), evaluate them as biased against women (Briere & Lanktree, 1983) and sexist (Murdock & Forsyth, 1985), and form a predominantly masculine impression of the *he/man* combination (Cole, Hill, & Dayley, 1983).

We are interested in exploring the presence of a similar male bias, but at the level of visual images, that may be associated with masculine generics. If individuals use, evaluate, and interpret the masculine generics in a male-specific manner, do they also visualize male images evoked by these generics? At least one author has claimed that they would:

> If you begin to write a book about man or to conceive a theory about man you cannot avoid using this word (man). You cannot avoid using a pronoun as a substitute for this word, and you will use the pronoun 'he' as a simple matter of linguistic convenience. But before you are half-way through the first chapter a mental image of this evolving creature begins to form in your mind. It will be a male image, and he will be the hero of the story: everything and everybody in the story will relate to him. (Morgan, 1972, pp. 8-9).

Evidence for generic-evoked male images, however, is indirect and unconvincing. In the study cited above, Martyna (1978) asked her subjects at the end of the experiment whether they had received any image while completing the sentence fragments. Subjects of both sexes reported receiving male images and female images while choosing pronouns for male- and female-related topics, respectively. The pronoun was then chosen to match the gender of the image. These sex-specific images, however, were stimulated by sentences containing sex-related roles (e.g., engineer, baby-sitter) rather than by masculine generics. There are other studies that used generics as stimuli, but the dependent measures were only remotely related to images. For example, Harrison (1975) asked junior high school students to draw pictures of early humans under various instructions. Students receiving the "early man, primitive man, and mankind and he" instruction drew significantly more pictures of males than students who received other, more neutrally worded, instructions. Schneider and Hacker (1973) asked junior high school students to select pictures to illustrate the chapter themes of a sociology textbook. The chapter headings were worded in the generic masculine ("Social Man," "Industrial Man," "Political Man") for half of the subjects and neutrally for the other half ("Society," "Industrial," "Political Behaviour.") Relative to the neutral condition, the man condition resulted in the overselection of man-only photos. Using a similar technique, Martyna (1980) found that 20% of

college students said a female picture did not apply to a sentence containing the generic *he.* This figure rose to 40% when the picture was presented simultaneously with, rather than after, the sentence. It is not clear if these picture studies measured images or simply elicited responses reflecting subjects' interpretation of the generics.

Tachistocopical presentation of information may provide a more direct measure of generic-induced visual images. In a tachistoscope, two fields of views are available to the viewer. The first field is on constant view, the second field can be flashed into view for a very short adjustable time interval. A stimulus sentence containing masculine generics can be placed in the first field and a photograph of a face in the second. If the viewer is presented with the photograph at a time exposure slightly below the threshold for correct recognition, then the viewer would "see" a face but would be unable to correctly recognize its gender. In such an ambiguous situation, the image (if any) induced by the sentence on view in the first field would influence the resolution of the ambiguity, and this could be measured by noting the frequencies of male and female faces that the viewer reported. In the following experiment, we compared the frequencies of reported male faces under a masculine (*men, he*) and a feminine (*feminists, she*) generic condition, expecting to find a significantly greater number of male faces in the former condition. Another way of expressing the prediction is that the frequency of recognitions of *female* faces would be greater in the feminine than in the masculine condition. These two hypotheses are nonorthogonal because the frequencies of male and female faces always sum to a constant. Male faces were chosen as the dependent measure in keeping with the research emphasis on masculine generics.

METHOD

Subjects and Design

Subjects were 48 voluntary students (24 men and 24 women) who participated on the understanding that they would be taking part in an experiment on subliminal perception that would require them to identify faces flashed into view at very short exposure times. A masculine generic and a feminine generic condition were set up by presenting masculine or feminine generic stimulus sentences in the first field of the tachistoscope. To counterbalance subject gender, equal numbers of male and female subjects were assigned randomly to the conditions. The resulting 2 × 2 factoral design enabled gender of subject to be included as an exploratory factor.

Stimulus Materials

There were 12 stimulus photographs of faces, each measuring 8.5 ×
13 cm. Half the photographs were female faces and the other half were male
faces. The male and female faces had been matched for visual cues such as
youthfulness, ethnicity, length of hair, and shape of face. Two photographs
of each sex were used in the pretest to establish, for each subject, the threshold
exposure time required for correct recognition of the sex of the face. The
remaining 8 faces were used in the main test.

Four sentences containing generics were used to set up the generic con-
ditions:

1. All men are created equal.
2. At university a student can study whatever he wants.
3. The feminists protested outside the two hall.
4. At university a student can study whatever she wants.

Sentences 1 and 2 were used in the masculine generic condition, and Sen-
tences 3 and 4 were used in the feminine generic condition. *Feminist* is often
used to refer to women only, although in fact the word can be used to in-
clude both men and women. *She* was included as the grammatical equiva-
lent of *he* although *she* is rarely used in the generic sense.

Procedure

*1. Initial Test to Determine the Time Threshold for Correct Face Recog-
nition.* After the subject was seated comfortably in front of the tachistoscope,
and given some practice viewing to get accustomed to the machine, the ex-
perimenter gave the following instructions:

> I am going to present a series of faces to you at very short exposure times. I want
> you to say whether you recognise the face as being female or male. You may answer
> "I don't know." I will not tell you if you are right or wrong. Please free your mind
> from distractions and concentrate carefully. Are there any questions?

The four faces (2 female, 2 male) were individually flashed into view in a
continuous but random order at various exposure intervals, until the subject
was able to positively recognize the sex of the faces (i.e., give three correct
answers in a row), at which point the threshold value was determined.

2. Main Test. The tachistoscope was then set at 2 msec below this threshold
value. The experimenter gave the following instructions to the subject:

> Now I am going to place a sentence in your viewing field. Can you see it? I want
> you to read the sentence and think about it. I will now present another series of faces.
> Again I want you to tell me if it is a female or male face. You may *not* answer "I
> don't know." I will only present each face once, and I will not tell you if you are
> right or wrong. In the previous part of this task I tested your recognition when your

mind was free from distractions. Here I want you to keep re-reading and thinking about the sentence through all the trials. Are you ready?

The subject was shown the 8 target pictures (4 female, 4 male) in random order, and the type of response (i.e., male or female) was noted for each exposure. In the masculine generic condition, half the subjects were shown Sentence 1 with the first 4 photographs and Sentence 2 with the last 4 photographs. The other half of the subject were shown Sentence 2 first and then Sentence 1. Subjects in the feminine generic condition were shown Sentences 3 and 4, again counterbalanced for order. It was assumed that the two sets of stimulus sentences would induce the subjects to think of sex-specific images rather than images of both men and women, and that these sex-specific images would influence the subthreshold perception of the faces. Were this true, there would be more male faces reported in the masculine than in the feminine generic condition.

   3. *Attitude Toward Masculine Generics.* After the eighth trial, the subject was given a short passage to read and to assess. The passage was an altered version of an extract from the 1971 American Psychological Association Ethical Standards for Psychologists. Deliberate spelling and grammar mistakes were added and the original 15 generic pronouns were left in. The subject was asked to read the photograph for content and style, and to make any adjustments or correlations necessary. If she/he felt no adjustments were necessary, then she/he was to just leave it. This correlation task was to gauge the subject's attitude toward the use of generic language for the purpose of checking any systematic variation in attitude among the experimental cells.

   4. *Posttest Interview.* Finally, the subject was asked, "How confident were you in your responses to the face recognition task?" on a 7-point scale (1, *not at all confident;* 7, *very confident*) and then asked to introspect: "Did the sentences in the viewing machine make you think of just women/men or of both men and women?"

RESULTS

   The major factor of interest was the masculine/feminine condition. This was combined with gender of subject to form a two-way analysis of variance (ANOVA) design in the following analyses. Inclusion of subject gender would give a full picture of the results, including any of its possible effects.

Preliminary Analyses

   1. *Threshold Times for Face Recognition.* The ANOVA carried out on the threshold times found no significant main or interaction effects.

2. Attitudes. An attitude score was derived by noting how many of the 15 masculine generic words in the passage were corrected by the subject. ANOVA revealed no significant effects. The mean scores varied from 8.4 to 9.4.

3. Confidence of Face Recognition. The confidence levels again showed no significant effects, with means varying between 3.3 and 4.3.

Face Recognition

The number of male face responses out of 8 trials were analyzed by means of the same two-way ANOVA as above. The results showed a significant condition effect [$F(1,44) = 8.25, p < .005, Ms$ error $= 1.33$] and no other effect. The group mean was significantly higher in the masculine generic condition (4.62) than in the feminine generic condition (3.66). Table I shows the cell means and standard deviations.

The results were examined in another way by first classifying each subject into either the male, female, or equal response category. A subject who reported more than 4 male faces would be classified in the male response category, one who reported more than 4 females faces would be in the female category, and one who reported 4 male and 4 female faces would be in the equal category. Table II shows the frequencies of subjects in each cell. The three-way classification table was analyzed by a log-linear model of chi-square test. There was no significant effect. Only the chi-square value of the Response × Condition effect remotely approached significance ($\chi^2 = 4.06$, $df = 2, p = .13$). The equal response was then ignored, and the male and female subjects pooled. The subsequent 2 (male/female response) × 2 (masculine generic/feminine generic condition) contingency table showed a significant chi-square value of 3.98 ($df = 1, p < .05$).

Table I. Number of Reported Males Faces out of 8 Photographs[a]

	Masculine generic			Feminine generic		
Gender of subject	Mean	SD	n	Mean	SD	n
Female	4.33	1.07	12	3.58	1.16	12
Male	4.92	1.31	12	3.75	1.06	12

[a]Two-way ANOVA yielded only one significant effect of the masculine/feminine generic condition factor, $F(1, 44) = 8.25$, $p < .005$. The mean was greater in the masculine (4.62) than feminine (3.66) generic condition.

Table II. Frequencies of Female, Male, and Equal Responses[a]

Subject	Generic condition	n	Response		
			Female	Male	Equal
Female	Masculine	12	3	5	4
	Feminine	12	5	3	4
Male	Masculine	12	1	7	4
	Feminine	12	4	3	5

[a]Female response = 5 or more reported female faces. Male response = 5 or more reported male faces. Equal response = 4 male and 4 female reported faces.

Self-Reported Images

Subject's answer to the question "Did the sentences make you think of just men/women or of both men and women?" was classified either as "specific" (i.e., where the subject reported thinking of either men or women), "generic" (i.e., where the subject reported thinking of both men and women), or "unaware" (where subject felt unaware of thinking of anything in particular). In the specific category all the subjects reported images that corresponded to their experimental condition, i.e., subjects in the masculine generic condition reported images of males, and in the feminine generic condition they reported images of women. As shown in Table III, specific responses were given by 33 subjects, or almost 70% of the total sample. When the data were collapsed across gender of subjects, they showed that the specific responses occurred mostly in the feminine condition ($n = 21$). The generic responses, in contrast, occurred almost exclusively (9 out of 10) in the masculine condition. Unaware responses were about evenly divided between conditions. The specific and generic responses (ignoring the unaware responses) were cast into a 2 (specific/generic) × 2 (masculine/feminine) contingency table for chi-square test, which yielded a significant chi-square value of 8.84 ($df = 1, p < .01$). As two of the expected cell frequencies in the above 2 × 2 table were around 5, they were raised by adding the unaware cell to the correspond-

Table III. Frequencies of Specific, Generic, and Unaware Responses[a]

Subject	Generic condition	n	Response		
			Specific	Generic	Unaware
Female	Masculine	12	4	6	2
	Feminine	12	11	1	0
Male	Masculine	12	8	3	1
	Feminine	12	10	0	2

[a]Specific response = thinking of either men or women, but not both. Generic response = thinking of both men and women. Unaware response = Unaware of thinking anything in particular.

ing generic cell. The subsequent chi-square test showed a lower but still significant chi-square value of 7.85 ($df = 1$, $p < .01$).

DISCUSSION AND CONCLUSION

The generic conditions led to a significant difference in the number of male face responses in the predicted direction: male faces were overreported in the masculine generic condition but underreported in the feminine generic condition. (In other words, *female* faces were underreported in the masculine condition and overreported in the feminine condition.) This finding was fairly clear-cut as there was no significant between-conditions differences in threshold value, confidence, or attitude. It was also consistent with the significant condition-linked frequency distribution result, and with the result that almost 70% of subjects reported receiving sex-specific images/thoughts corresponding to the stimulus generic sentences.

A stronger test for generic-induced images would be to compare each of the two conditions against the chance level of male faces (i.e., 4) rather than by comparing between the two conditions. Matched-pair *t* tests showed a significant comparison in the masculine condition [mean = 4.62, $t(23) = 2.53$, $p < .02$] but not in the feminine condition [mean = 3.66, $t(23) = -1.50$].

The negative results in the feminine condition was surprising as one might have assumed that *feminists* and *she* would be more clearly sex-specific than *men* and *he*. The assumption was consistent with the introspection results, which showed that most of the sex-specific images were reported in the feminine condition (Table III). One possible explanation of the negative finding in question can be considered. Generic masculines have been codified in the English language for a long time. They were installed as legal usage by a British Act of Parliament in 1850, and much earlier, in 1746, as a grammatical rule by John Kirby (both were adhered to in New Zealand). They are still frequently used. MacKay (1980), for example, has estimated that any one person may come in contact with generic *he* over ten million times during the person's life time. Together with other instruments of male dominance, either intentional or unintentional, such as the biblical portrayal of a male god, they impart a sense of "maleness" onto the world they describe, making women invisible. As a result, individuals may tend to see the world as inhabited mainly by males. For example, Wise and Rafferty (1982) have shown that the seemingly neutral terms of *child* and *adult* actually stimulated people to think of males more often than of females. In the present experiment, a similar bias might have been operating in the feminine

condition against the visualization of female images at the perceptual level, even though at the more conscious level of introspection, 19 of the 24 subjects in the feminine condition reported thinking of female images only.

It should be noted that our tachistoscopical procedure did not measure images directly, but only enabled us to infer beyond reasonable doubt that images might have been induced by the generic sentences. This procedure represents a novel application of an experimental psychology technique to the study of sexism in generics. Another technique worth trying is binocular rivalry resolution (Pettigrew, Allport, & Barnett, 1958). Finally, there is a need for developmental research. In the course of language development in children, it is likely that the masculine-specific meaning is learned prior to the generic meaning. The latter would require a relearning that the same word now has a double meaning. The task is relatively straightforward for boys, who only need to generalize the term to all creatures not obviously female, but it is more complicated for girls, who must learn to apply the term originally acquired in its male-specific context to themselves (Nilsen, 1977). One may hypothesize that among children, age is negatively correlated with generic-induced male images, and that this correlation coincides with the formal teaching of grammar, particularly on the part of girls.

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