Gender Differences in Russian Colour Naming

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ABSTRACT

In the present study we explored Russian colour naming in a web-based psycholinguistic experiment (http://www.colournaming.com). Colour singletons representing the Munsell Color Solid (N=600 in total) were presented on a computer monitor and named using an unconstrained colour-naming method. Respondents were Russian speakers (N=713). For gender-split equal-size samples (N_F=333, N_M=333) we estimated and compared (i) location of centroids of 12 Russian basic colour terms (BCTs); (ii) the number of words in colour descriptors; (iii) occurrences of BCTs most frequent non-BCTs. We found a close correspondence between females' and males' BCT centroids. Among individual BCTs, the highest inter-gender agreement was for *seryj* 'grey' and *goluboj* 'light blue', while the lowest was for *sinij* 'dark blue' and *krasnyj* 'red'. Females revealed a significantly richer repertory of distinct colour descriptors, with great variety of monolexemic non-BCTs and "fancy" colour names; in comparison, males offered relatively more BCTs or their compounds. Along with these measures, we gauged denotata of most frequent CTs, reflected by linguistic segmentation of colour space, by employing a synthetic observer trained by gender-specific responses. This psycholinguistic representation revealed females' more refined linguistic segmentation, compared to males, with higher linguistic density predominantly along the red-green axis of colour space.

KEYWORDS: Russian, colour naming, gender differences

INTRODUCTION

Gender differences in colour lexicon have been demonstrated in numerous English-language studies [e.g. 1,2]. They revealed that women possess a more extensive colour vocabulary than men. Also, in addition to BCTs, women use significantly more elaborate terms, such as BCT hyponyms (e.g. *scarlet* or *chartreuse)*, and offer many more "fancy" colour terms (like *cerise pink*), while men tend to use predominantly BCTs accompanied by various (lightness) modifiers, as well as compound names of BCTs.

To our knowledge, gender differences in Russian colour nomenclature have hardly been explored. The focus of the present study is on gender differences of Russian speakers' colour term inventory. We analysed responses of a large sample of Russian respondents who have taken part in a web-based experiment, to explore gender-specific colour naming strategies and colour nomenclature.

EXPERIMENTAL

Data were collected in an online colour naming experiment previously employed for English speakers [3]. The experimental procedure consisted of six steps (for further details of the procedure see [3]). The fourth, main part was the unconstrained colour-naming task: any colour descriptor, either a single word, or a compound, or term(s) with modifiers could be produced to describe each of 20 presented colours randomly selected from 600 colours total densely sampling 3D Munsell Color Solid and defined in the CIELAB chromaticity diagram. Information about participant's gender was collected, among other demographic characteristics.

The total sample consisted of Russian respondents (N=713; 380 females). The dataset was refined to include responses of equal-size gender subsamples (N_F=333, N_M=333). Analysis of these enabled estimation of gender differences in (i) location of centroids of BCTs (in CIELAB coordinates); (ii) the number of words used in colour

descriptors; (iii) frequency of occurrence of BCTs and salient non-BCTs; and (iv) linguistic segmentation of perceptual colour space.

RESULTS AND DISCUSSION

Unlike English with 11 BCTs, Russian basic colour inventory comprises 12 BCTs: *belyj* 'white', *čërnyj* 'black', *krasnyj* 'red', *zelënyj* 'green', *žëltyj* 'yellow', *seryj* 'grey', *fioletovyj* 'purple', *rozovyj* 'pink', *oranževyj* 'orange', *koričnevyj* 'brown' and two BCTs for 'blue', *sinij* 'blue/dark blue' and *goluboj* 'light blue' [4].

(i) Location of centroids of 12 Russian basic colour terms (BCTs) in gender-split samples

We found a very good inter-gender correspondence between centroids of the 12 Russian BCTs (Figure 1). Measured by distances (ΔE^*_{ab}) in the 3D CIELAB space, mean centroid difference was relatively small (ΔE^*_{ab}=3.43) and lower than that for English-speaking females and males (ΔE^*_{ab}= 6.25) [5]. Among individual Russian BCTs, the highest inter-gender agreement was for *seryj* 'grey' (ΔE^*_{ab}=0.60) and *goluboj* 'light blue' (ΔE^*_{ab}=0.96), while the lowest was for *sinij* 'blue/dark blue' (ΔE^*_{ab}=8.02) and *krasnyj* 'red' (ΔE^*_{ab}=6.37).

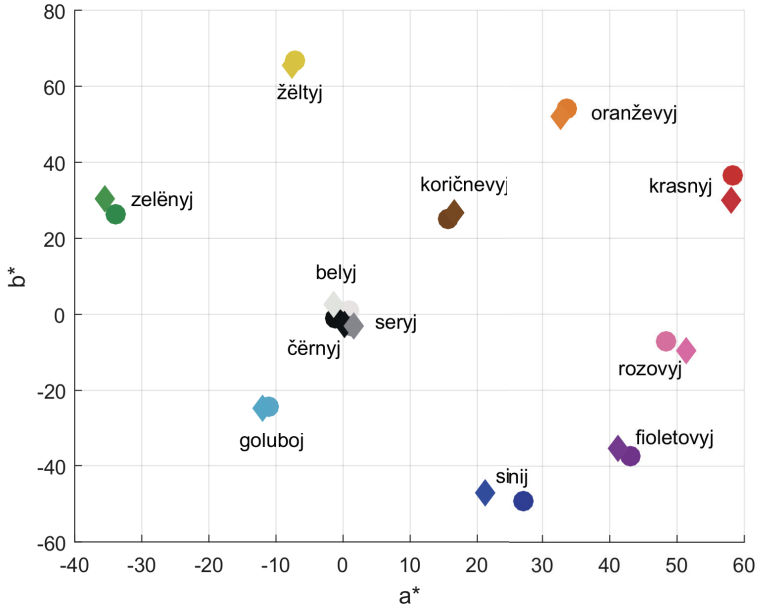

*Figure 1: CIELAB space, a*b* plane: Location of centroids for the 12 Russian BCTs for females (circles) and males (diamonds).*

(ii) Number of words in colour descriptors in gender-split samples

As expected, females revealed a richer colour vocabulary, assessed by the number of unique colour descriptors, N_F=821 (13%), compared to males, N_M=775 (12%). Notably, males produced proportionally more BCTs than females (43% vs. 35%); conversely, females offered more monolexemic non-BCTs than males, 29% vs. 22% respectively (Figure 2), in accord with previous findings for English speakers [1,2].

(iii) Repertory of the Russian BCTs and most frequent non-BCTs in females and males

Occurrence of the 12 BCTs was greater for males than for females: N_M=2,718 vs. N_F=2,208. Almost all individual BCTs occurred more often in men's responses, except *goluboj* 'light blue' that was used slightly more frequently by women (Figure 3). Notably, the first ten most frequent CTs are identical for females and males, although the ranking order slightly differed between genders. Along with eight chromatic BCTs, these included two Russian salient non-BCTs, *sirenevyj* 'lilac' and *birûzovyj* 'turquoise', on 7th and 8th positions for females and 10th and 9th for males. The repertory of other most frequent colour names (ranks 11 through 26) showed noticeable

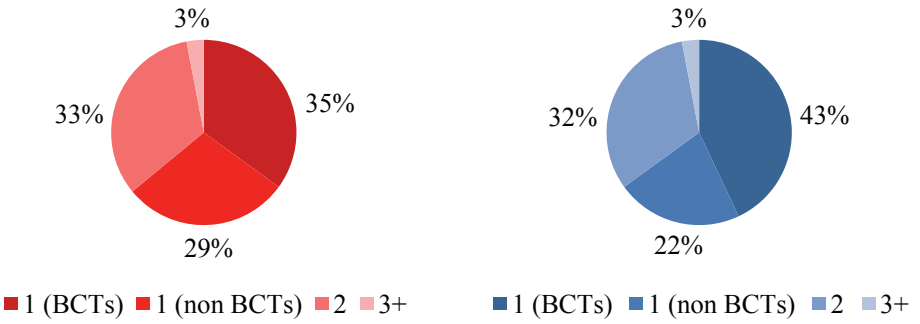

Figure 2: Percentage of colour descriptors with varying number of words in responses of Russian females (left) and males (right).

gender differences: *krasnyj* 'red' was significantly more frequent in men's lexicon (rank 11) than in women's (rank 25). Furthermore, salient non-BCT *beževyj* 'beige' (rank 17) and three "fancy" terms in women's lexicon, *persikovyj* 'peach' (rank 20), *svetlo-fioletovyj* 'light purple' (rank 21) and *bolotnyj* 'marsh-coloured' (rank 22), were not among men's most frequent terms. Conversely, four terms, *purpurnyj* 'cardinal red', *svetlo-koričnevyj* 'light brown', *bledno-rozovyj* 'pale pink' and *tëmno-rozovyj* 'dark pink', were high in frequency for men (ranks 20, 22, 25, and 26 respectively) but did not occur among women's frequent names.

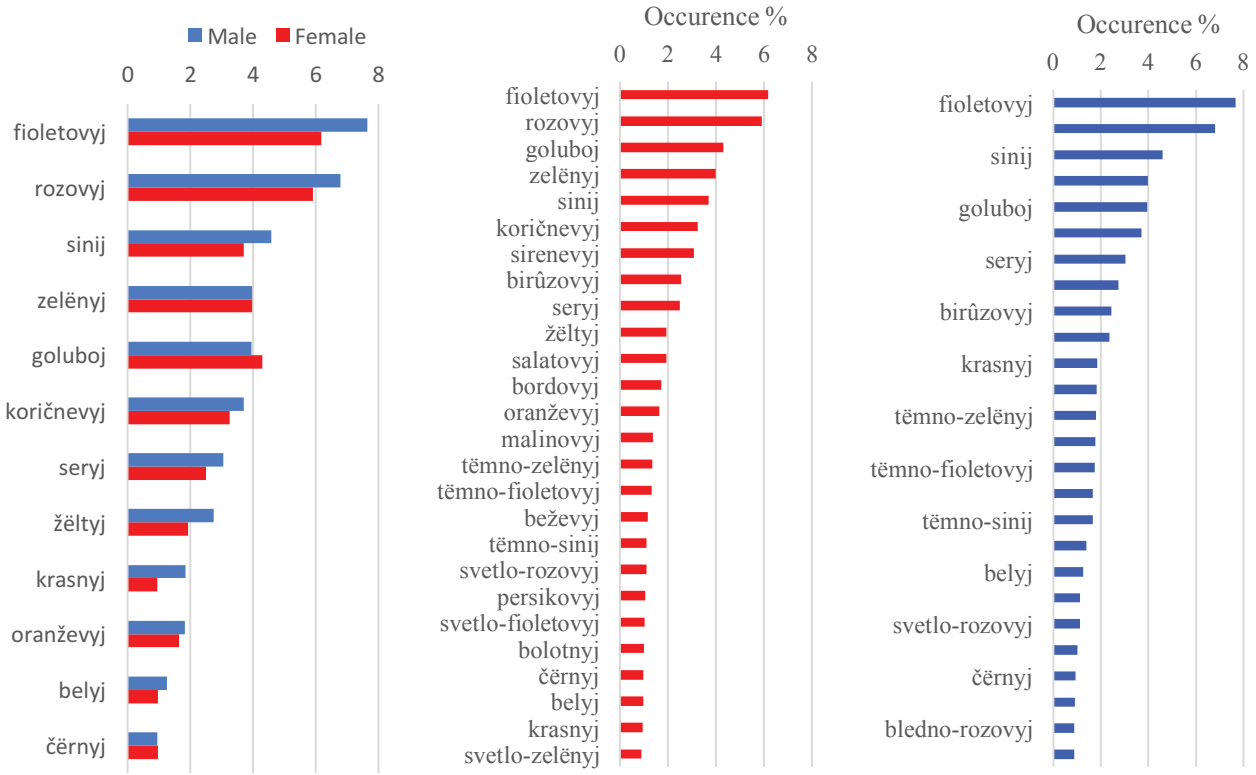

Figure 3: Percentage of occurrence of the 12 Russian BCTs (left) and 26 most frequent colour names elicited in females (middle) and males (right).

(iv) Synthetic image: Linguistic segmentation of colour space by females vs. males

To visualize gender differences in Russian colour naming, a probabilistic algorithm [6] trained by female and male responses was used to segment a synthetic image in CIELAB (Figure 4). Coordinates of the centroids of the most frequent descriptors were used to colour each linguistic category.

Females' segmentation is more refined (26 categories; Figure 4, middle) compared to coarser males' segmentation (19 categories; Figure 4, right). The inter-gender differences in linguistic density are mainly along the red-green axis of colour space: in particular, females lexically differentiate bright (*jarko-*) colour shades of pink, lilac or green (*jarko-rozovyj, jarko-sirenevyj, jarko-zelënyj* respectively). In addition, they use object glosses referring to berries (*malinovyj* 'raspberry'), fruits (*persikovyj* 'peach'), plants (*gorčičnyj* 'mustard-coloured'), flowers (*fuksiâ* 'fuchsia') or natural materials (*pesočnyj* 'sand-coloured'). In comparison, men reveal refined lexicalisation of green-yellow gamut (*khaki* 'khaki', *sero-zelënyj* 'grey-green', *grâzno-žëltyj* 'dirty yellow').

Figure 4: Segmentation of colour space: Left: Synthetic image; Middle: Segmentation for Russian-speaking females; Right: Segmentation for Russian-speaking males.

CONCLUSION

Gender differences in Russian speakers' colour naming are in accord with those found in studies of English speakers [1,2], specifically, women exceed men in richness of colour lexicon. Similarly, two genders of Russian speakers differ in the inventories of most frequent colour terms: along with BCTs, women resort toelaborated colour descriptors, monolexemic non-BCTs or "fancy" colour names, whereas men tend to name colours with BCTs or their compounds.

Russian-speaking women, compared to men, also revealed denser linguistic segmentation along the red-green axis of colour space. Females' additional segmented names reflect lexical differentiation of bright shades of basic and non-basic colour categories, as well as resorting to glosses referring to colour of natural objects and materials.

The similarity of colour-naming differences in Russian and English speakers provide a strong argument for the "nurture" origin of the phenomenon – due to gender-specific patterns of socialisation, similar in the modern Russian society and the Anglo-Saxon world, that appear to result in a greater awareness of colour in women reflected by its distinct and elaborated linguistic representation.

ACKNOWLEDGEMENTS

Dimitris Mylonas was supported by the Doctoral Training Grant EP/M506448/1-1573073 from the Engineering and Physical Sciences Research Council (UK).

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