

THE EFFECT OF SPACING ON READING ((H. Kawashima¹, K. Oda²)) ¹Inst. of Special Education, Univ. of Tsukuba, Tsukuba; ²Dept. of Communication; Tokyo Woman's Christian Univ., Tokyo, JAPAN.

Purpose: Our previous study (ARVO, 1999) has shown that the effect of letter spacing on letter recognition existed only for letter sizes smaller than critical print size in both central and peripheral vision. Does this result apply to reading? To address this issue, we tested the effect of letter spacing on reading speed at letter sizes smaller and larger than critical print size in central vision.

Method: We used the reading chart, which was similar to the Japanese version of MNREAD Acuity Chart (Oda et al., 1998) for children, presented on the computer display. The chart consisted of nine words in Japanese Hiragana characters which have fixed-width. Before testing, we measured reading speed as a function of letter size with close spacing and estimated critical print size (CPS), smallest size at which reading speed was maximum, for each subject. In the experiment, letter was set at sizes which were smaller and larger than CPS. Letter spacings were defined by center-to-center spacing of the letters in terms of multiples of letter width and there were two spacing conditions of 1 and 1.5 times the letter width. Six normal vision subjects participated in the experiment. We measured reading speed seven times for two sizes in two letter spacings.

Results: In the letter sizes smaller than CPS, reading speeds with wide spacing were faster than those obtained with close spacing ($p < 0.05$). However, in the letter sizes larger than CPS there was no difference in reading speeds for spacings.

Conclusion: Similar to the result of our letter recognition study, the effect of spacing on reading changes at the letter size of each subject's CPS. A clinical implication is that magnification power should be determined so that letter size exceeds client's CPS in order to avoid crowding effect. When letter size is smaller than CPS, better reading performance is expected with wide letter spacing.