

P L I A A
T R -B C C A

1, C, 1, A, 2, D, 2, C, 1

1D, B, G, D / B, k, C, k

2, C, B, k, C

C, D, 5, B, 100871, C, @, k

C, D, 5, B, 100871, C, @, k

: D, 10, 2013

A, : F, 10, 2014

C, D, C, A, C

Invest Ophthalmol Vis Sci.
2014;55:2020-2030. D
10.1167/.13-13739

P RPOSE.

METHODS. (22.5) (E)

(F), F

RES LTS.

F F

F 1.5 1.6 (P < 0.001)

E 53% (P < 0.001).

CONCL SIONS.

A

19 21

22

(E)

6 7 (

), 1, k, 23

2 8

24 26

9 11

k

3,12,13 (F, 2 4, D,

14 16

17,18

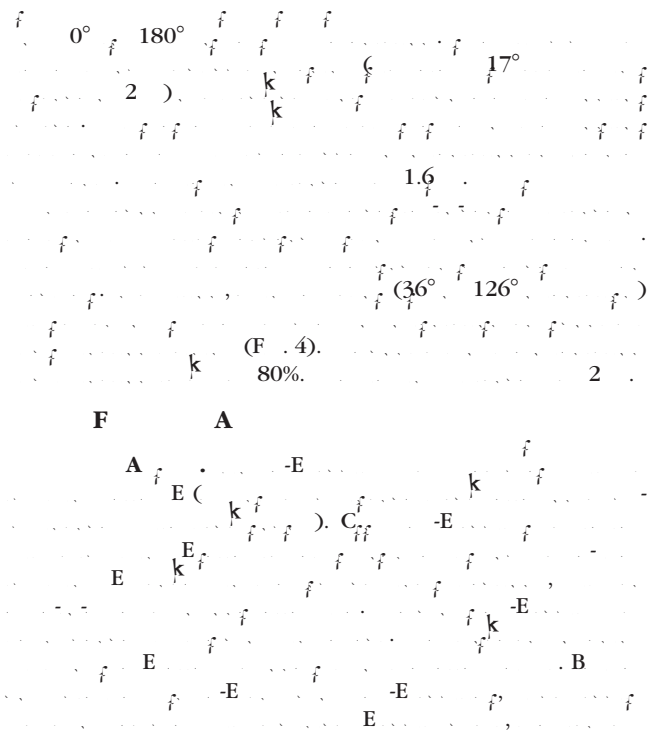
2

C, 2014 A

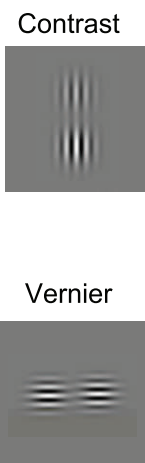
: 1552-5783



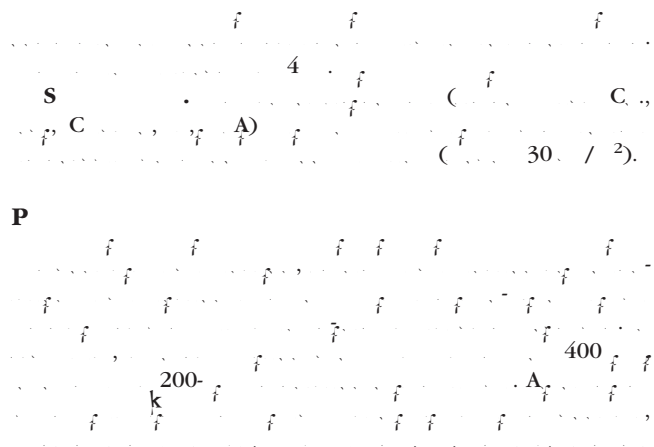
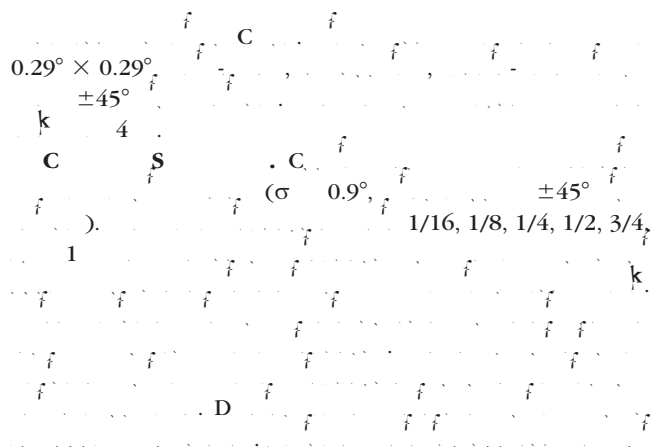
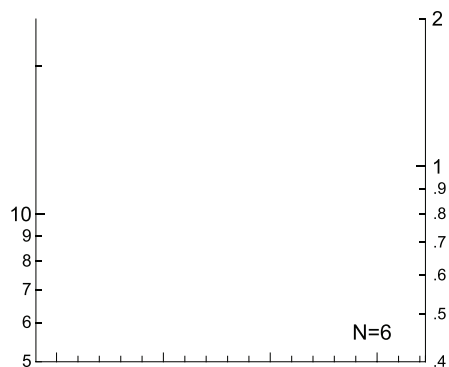
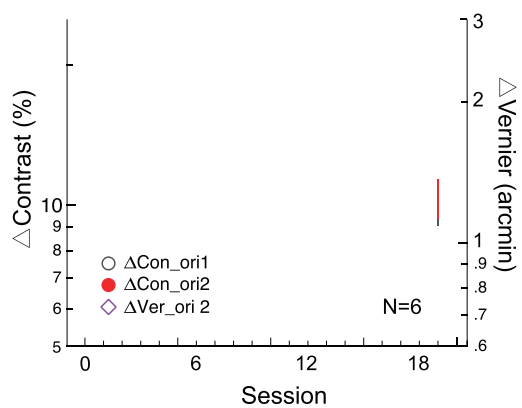
S
(F = 1),
(D = 0.7),
(2.4, 2.7),
(8.2, D = 1.8),
0.9,
k
(F = 2),
(80%),
(180°),
±50, (±2)

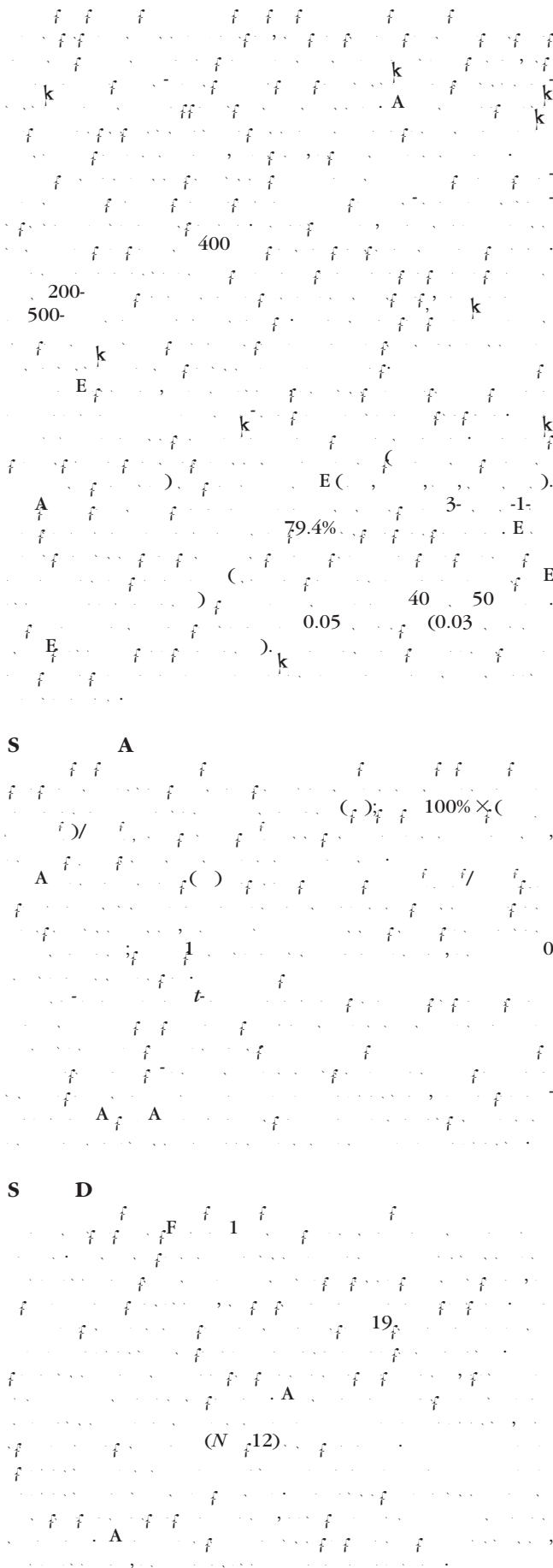


a



b





RESULTS

T T A P L
E TPE L S F

(2.4 ± 0.7 ; $F = 5$),

2.7

19 (N = 6)

8 10 2-

0° 90°

($F = 2$), (ΔC , 1, 1; $F = 2$), $16.1 \pm 1.8\%$, $10.7 \pm 1.0\%$, $32.5 \pm 3.2\%$ ($P < 0.001$), 21.5% , 44.7% .

90° (ΔC , 2, 1; $F = 2$), $15 \pm 5.9\%$, $P = 0.41$; 19.1% , 18.1% ,

F E

(ΔC , 2, 1; $F = 2$), $33.6 \pm 5.4\%$, $P < 0.001$; 14.4% , 53.1% . A

$14.9 \pm 1.4\%$, $10.4 \pm 0.9\%$ (ΔC , 2, 1; $F = 2$), $29.3 \pm 3.8\%$, $P < 0.001$; 18.6% , 44.9% , $28.6 \pm 4.5\%$ ($F = 2$, 15.0% , 47.4%), ($P = 0.59$, t).

E

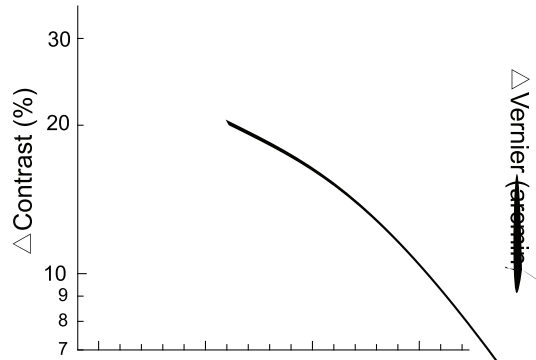
0.04 ± 0.18 , 0.94 ± 0.20 , 1 ($P = 0.39$),

(N = 6)

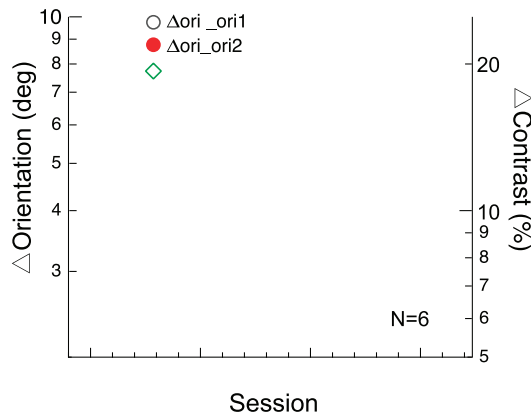
$11.5 \pm 1.0\%$, $8.1 \pm 0.9\%$ (ΔC , 1, 1; $F = 2$), $29.0 \pm 2.7\%$, $P < 0.001$; 18.9% , 38.2% ; $F = 2$).

$11.3 \pm 0.7\%$, $10.3 \pm 0.5\%$ (ΔC , 2, 1; $F = 2$), $8.5 \pm 3.0\%$, $P = 0.018$; 1.5% , 20.1% , 0.31 ± 0.09).

(ΔC , 2, 1; $F = 2$), $26.7 \pm 4.9\%$, $P = 0.001$; 10.4% , 42.5% , $8.9 \pm 1.0\%$ (ΔC , 2, 1; $F = 2$), $14.9 \pm 5.6\%$, $P = 0.023$; 3.1% , 32.9%), $22.7 \pm 3.8\%$ ($F = 2$, 7.3% , 35.2%), ($P = 0.11$, t).

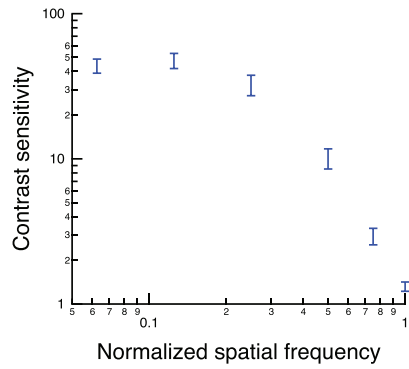


b



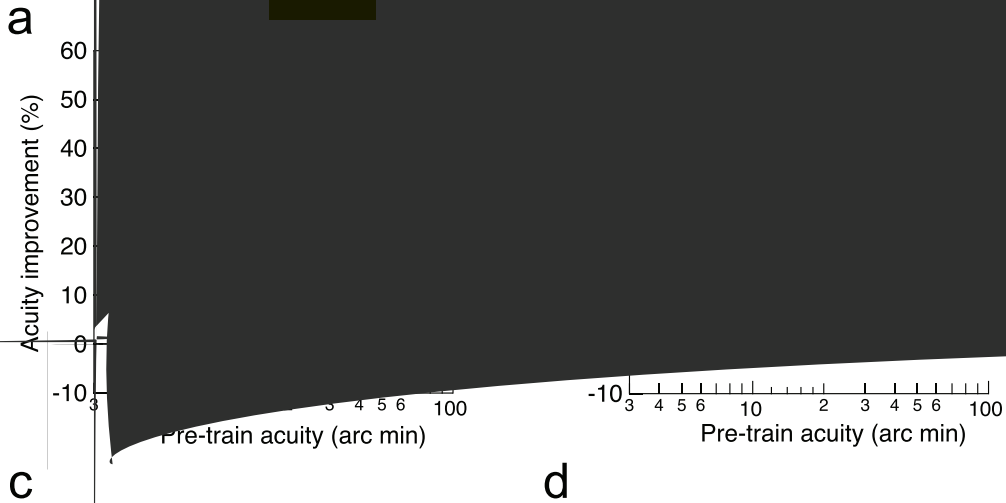
29.5%). $18.0 \pm 4.1\%$, $P = 0.1$
 35.5% . ΔC_1 1 $(P = 0.13)$, ΔC_2 2 $(P = 0.11)$.
 0.73 ± 0.19 , E 1 $(P = 0.11)$.
 F $(F = 4)$ k
 $3.8 \pm 0.6^\circ$ (Δ 1 , $36^\circ/126^\circ$) $6.2 \pm 1.1^\circ$
 28.6% 58.3% ; $F = 4$). $38.8 \pm 4.9\%$, $P = 0.001$;
 8.9% (Δ 2 , $8.3 \pm 5.1\%$, $P = 0.44$);
 6.3% , $P = 0.038$; 10.6% 31.1%) $14.2 \pm$

(Δ 2 , $5.5 \pm 0.8^\circ$
 $4.3 \pm 0.3^\circ$, $24.7 \pm 5.3\%$, $P = 0.003$; 10.6%
 47.9% . $30.6 \pm 6.9\%$, 11.6%
 52.7% , 0.76 ± 0.13 . A
 Δ 1 Δ 2
 $(P = 0.18)$, t $(P = 0.18)$.
 E k
T I TPE C S,
A S
C S F
 $28,29$ ($F = 5$);
 15.3 ± 1.0 .



24.9 ± 1.2 ($P < 0.001$).
 $F_{5, 90} = 7.36$, $P < 0.001$.
 14.93 , $P = 0.001$,
 $(F_{5, 90} = 7.36, P < 0.001)$.
 $5.30, 31$
 $(F_{1, 16} = 0.55, P = 0.47)$.
 $(F_{1, 16} = 9.54, P = 0.007)$.
 $(F_{1, 16} = 30.45, P < 0.001)$.

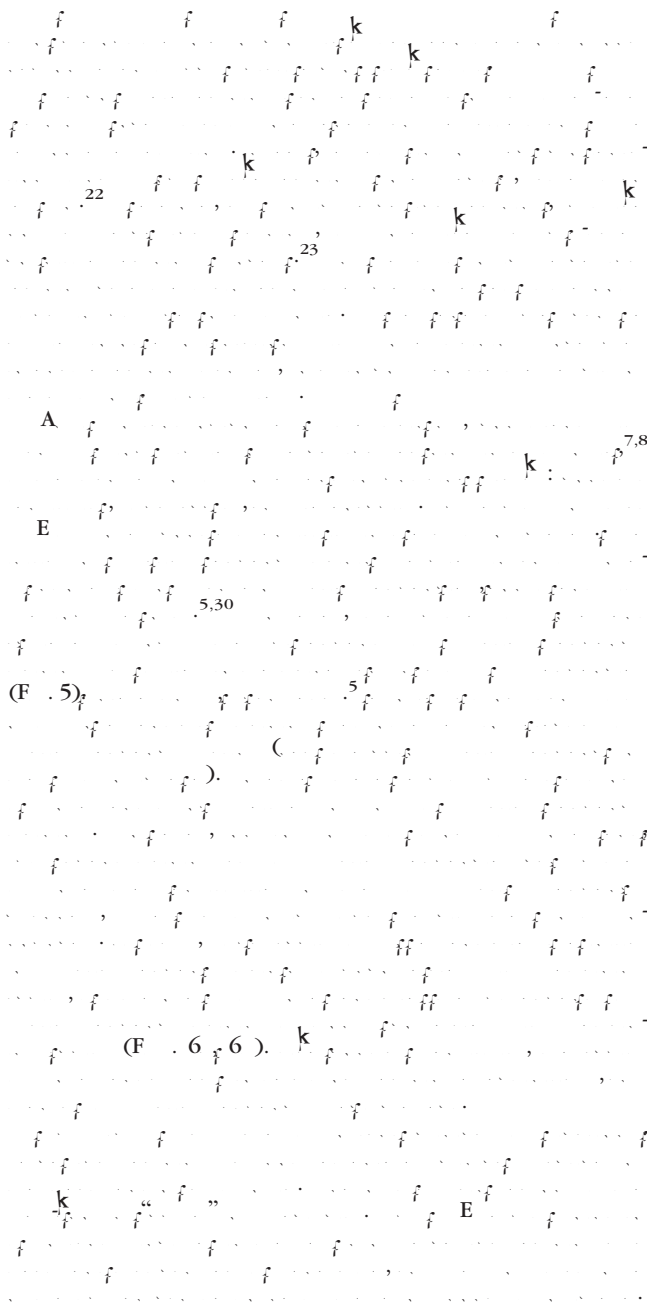
16.2 ± 1.9 , 13.1 ± 1.5 , $16.7 \pm 3.2\%$, $P < 0.001$; $F_{6, 118} = 24.0 \pm 4.8$, 19.5 ± 3.8 , 10.7 ± 0.9 , $14.9 \pm 2.8\%$, $P < 0.001$, 15.6 ± 2.6 , $14.5 \pm 2.9\%$, $P < 0.001$, $29.0 \pm 3.8\%$, 13.8% , 52.8% , $27.0 \pm 4.0\%$, 11.5% , 69.4% , $(F_{6, 118} = 1.6)$, 12 , $(P = 0.62, t = 1.5 \pm 0.2)$, $8.4 \pm 2.0\%$ (0.4), $(F_{1, 18} = 6.37, P = 0.021)$, $(F_{1, 18} = 3.56, P = 0.075)$, $(r = 0.33, P = 0.19)$, $(r = 0.40, P = 0.09)$, $(r = 0.65, P = 0.003)$, $(r = 0.69, P = 0.001)$, 24.1% ($n = 8$), 35.4% ($n = 14$), $(P = 0.053, t = 6)$, $S = 415.3 \pm 44.1$, 244.2 ± 32.3 , $(39.2 \pm 5.2\%, P < 0.001)$, 190.0 .



± 30.7 ($22.8\% \pm 5.8\%$, $P < 0.001$)
 $53.4\% \pm 5.1\%$, 20.0% , 92.5% (6 ,
 6), F , G ,
 500)
 600) A
 12 / 7
 $(40.5 \pm$
 8.3% , $36.9 \pm 2.3\%$, $P = 0.75$). B
 $(32.0 \pm 7.1\%$, $7.1 \pm 7.1\%$, P
 0.034 ,
 $(r = 0.085$, $P = 0.73)$,
 $(r = 0.32$, $P = 0.35$, n
 11).
 $(r = 0.38$, $P = 0.11)$,
 $(r = 0.59$, $P = 0.056$, $n = 11)$.

DISCUSSION

E. k E
 E E
 23
 k
 23
 19,20
 E
 E



SUMMARY

Perceptual learning in adult amblyopia was investigated using a task that required the identification of the orientation of a target letter (k) among a set of distractors. The results showed that amblyopic subjects improved their performance over time, and that this improvement was associated with changes in the neural response to the target letter. These findings suggest that perceptual learning can be used as a treatment for amblyopia.

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Dr. J. C. ...; L.-J. C. ...; S.A. K. ...; D.M. L. ...; C. ...

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