P L I A A T R -B C C

- ,[1] - C ,[1] A. ,[2] D . ,[2] C [1]

[1]D , D / B , k - C , k , B , G [2] , C , B k , C ,

C : - , D , 5 , B 100871, C ; @ k .
C , D , k , 5 , B 100871, C ; @ k .
: D 10, 2013
A : F 10, 2014
C : - C - , A, D , 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. k : , , ,

A (. .,) 6 7 ( ).[1] , 2 8 , 9 11 , k 3,12,13 (F . 2 4 k). 14 16 17,18 .

19 21 22 (E) k 23 , 24 26 D ?

C 2014 A : 1552-5783

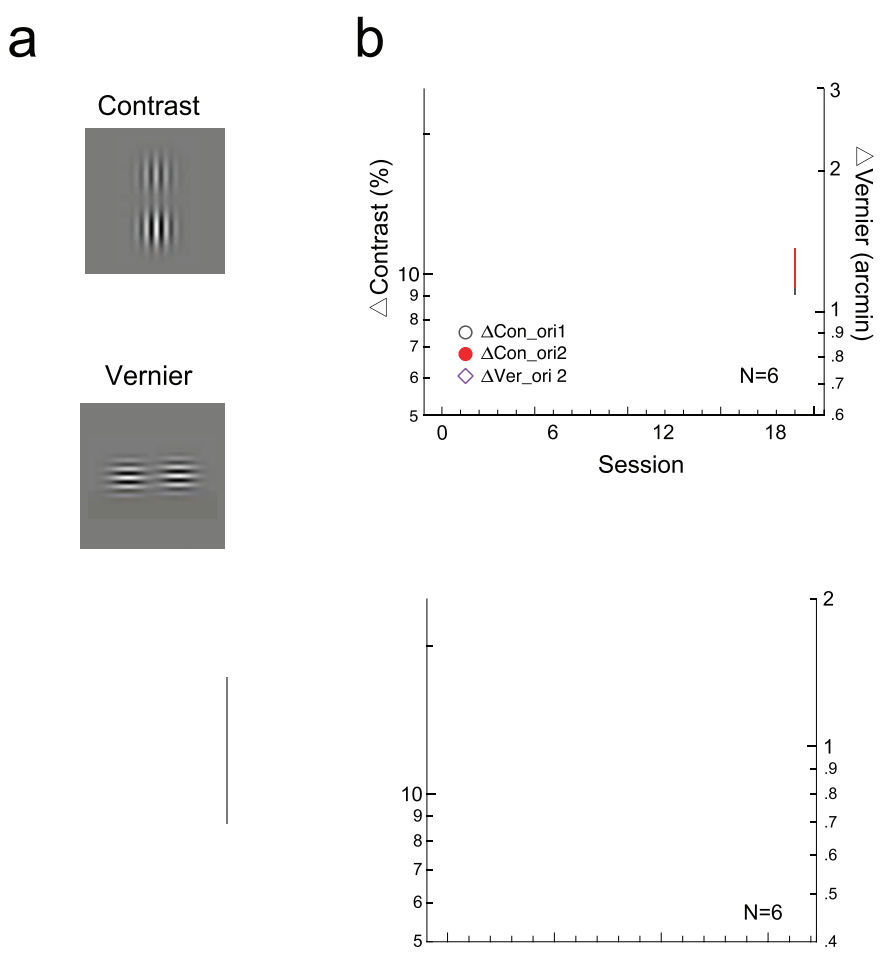
S

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

0° 180°
(17°
2) k
k
1.6
(36° 126°)
(F 4).
k 80%. 2 .

F A

A -E
E (k
k). C -E
E k E
-E
E . B
-E -E
E



C

0.29° × 0.29°

±45°

k 4

C S . C

(σ 0.9°, ±45°

). 1/16, 1/8, 1/4, 1/2, 3/4,

1 k

. D

4

S . (C .,

, C , , A)

(30 / ²).

P

400

200- k . A

400

200-
500-

E

A 3- -1-
79.4% E

E

40 50
0.05 (0.03
E).

S A

( ); 100% × (
)/ ,
A ( ) /
1 , 0
- *t*-
A A

S D

F 1
19
. A
(*N* 12)
A ,

RESULTS

T T A P L
E TPE L S F

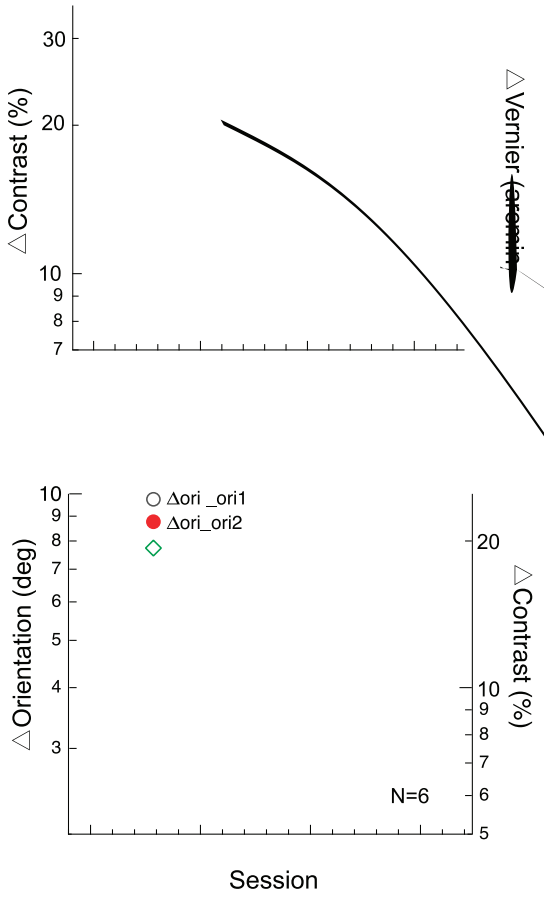
(2.4 ± 0.7 ; F . 5 ,),
2.7

19
(*N* 6)
k
8 10 2-
0° 90°
(F . 2).
(ΔC 1, -
1; F . 2),
16.1 ± 1.8% 10.7 ±
1.0%. 32.5 ± 3.2% (*P* < 0.001),
21.5% 44.7%.
90° (ΔC 2, 1.5 ±
5.9%, *P* 0.41; , 19.1% 18.1%),
F E ,
k,
(Δ 2, 33.6 ± 5.4%, *P* < 0.001; , 14.4%
53.1%). A ,
14.9 ± 1.4% 10.4 ± 0.9%
(ΔC 2, 29.3 ± 3.8%, *P* < 0.001; , 18.6%
44.9%). 28.6
± 4.5% (,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 ± 1.0% 8.1 ± 0.9% (ΔC 1,
29.0 ± 2.7%, *P* < 0.001; , 18.9% 38.2%; F . 2).
11.3 ± 0.7% 10.3 ± 0.5%
(ΔC 2, 8.5 ± 3.0%, *P* 0.018; , 1.5%
20.1%, 0.31 ± 0.09).
(Δ 2, 26.7 ± 4.9%, *P* 0.001; , 10.4%
42.5%).
8.9 ± 1.0%
(ΔC 2, 14.9 ± 5.6%, *P* 0.023; , 3.1%
32.9%).
22.7 ± 3.8% (, 7.3% 35.2%),
(*P* 0.11, - *t*-).

0.81 ± 0.15, 1 (*P* 0.12).

E , . A (*N* 7) - E (E), , E. , (Δ 2, 40.4 ± 4.7%, *P* < 0.001; , 24.3% 55.0%; F . 3), 13.7 ± 1.3% 12.6 ± 1.0% (ΔC 2, 6.7 ± 3.3%, *P* 0.044;



29.5%). 18.0 ± 4.1%, 0.1% 35.5%.

ΔC 1 ΔC 2 E (*P* 0.13, - *t*-). 0.73 ± 0.19, 1 (*P* 0.11). , E

F (F 4) k

(36°/126°) 6.2° ± 1.1° 3.8° ± 0.6° (Δ 1, 38.8 ± 4.9%, *P* 0.001; , 28.6% 58.3%; F . 4).

(Δ 2, 8.3 ± 5.1%, *P* 0.44; , 8.9% 21.6%).

(ΔC 2, 14.2 ± 6.3%, *P* 0.038; , 10.6% 31.1%)

(Δ 2, 5.5° ± 0.8° 4.3° ± 0.3°, 24.7 ± 5.3%, *P* 0.003; , 10.6% 47.9%). 30.6 ± 6.9%, 11.6% 52.7%, 0.76 ± 0.13. A Δ 1 Δ 2 (*P* 0.18, - *t*-).

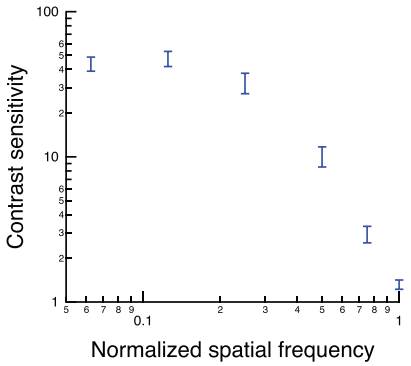
E- k

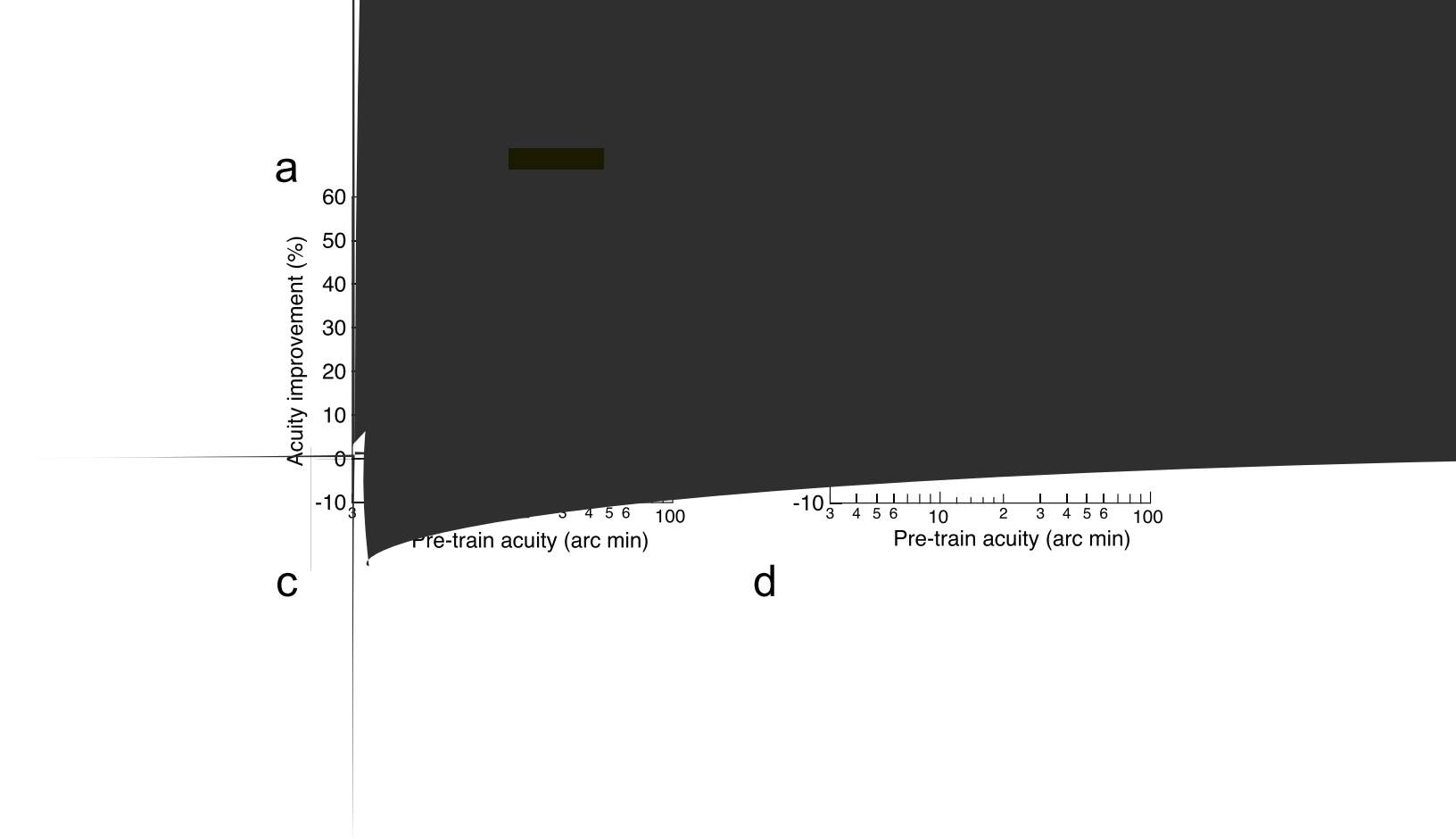
T I TPE C S , A , S

C S F .

28,29 (F . 5).

15.3 ± 1.0 ,


Contrast sensitivity
Normalized spatial frequency



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

DISC SSION

E. k E E E 23 , k 2,3 19,20 E E ,

S MMAR

Acn % g mn t/

F C 3310000459 (-) 1230030 (C), 1E 04776 (A) 1E 01728 01E 020976 (D).

D : **J.- .** ; **L.-J. C** ; **S.A. K** ; **D.M. L** ; **C.** ,

R rn c

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