言語、文化、思考の関係

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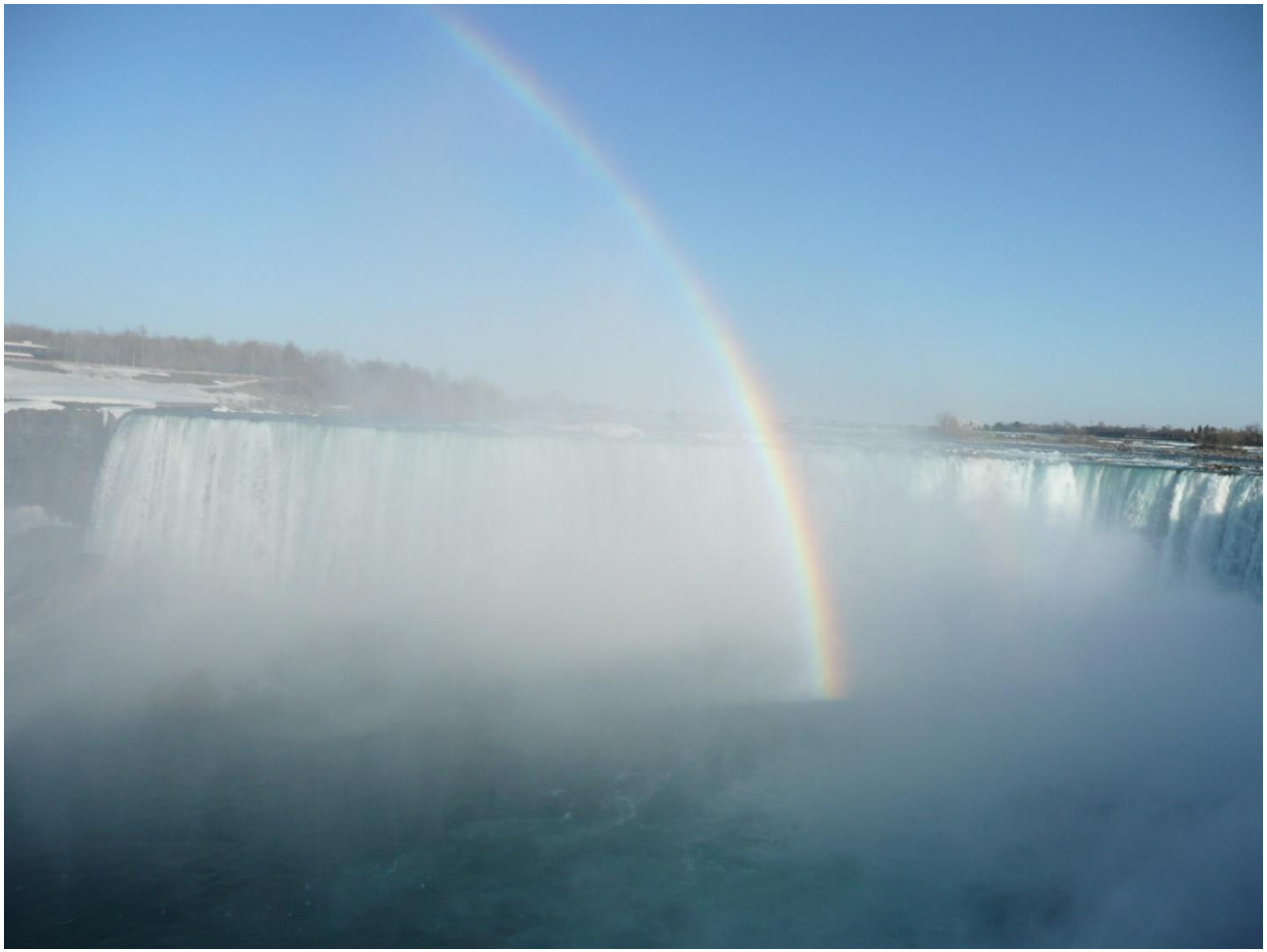
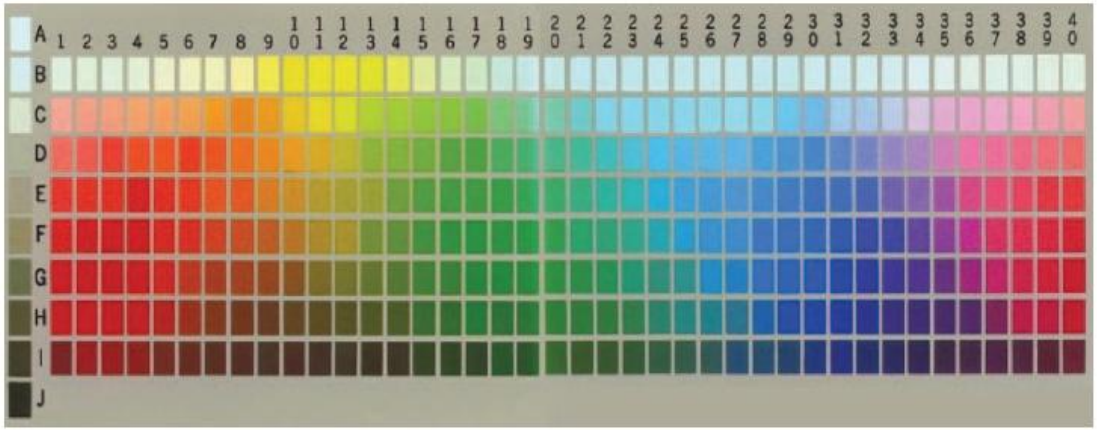
虹の色は何色？




A
B
C
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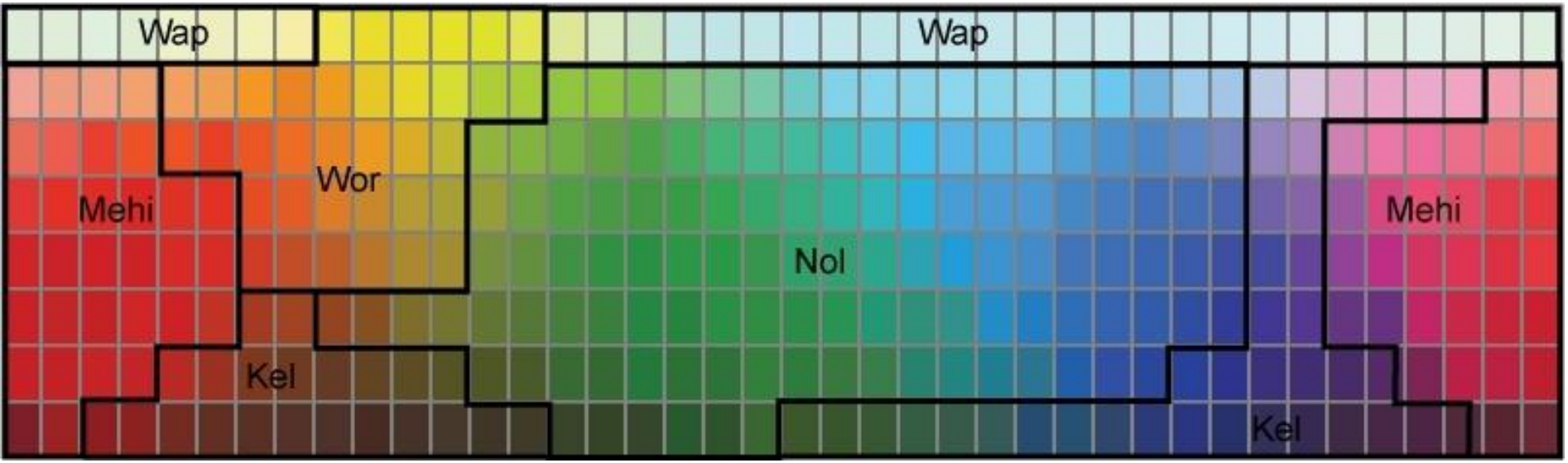
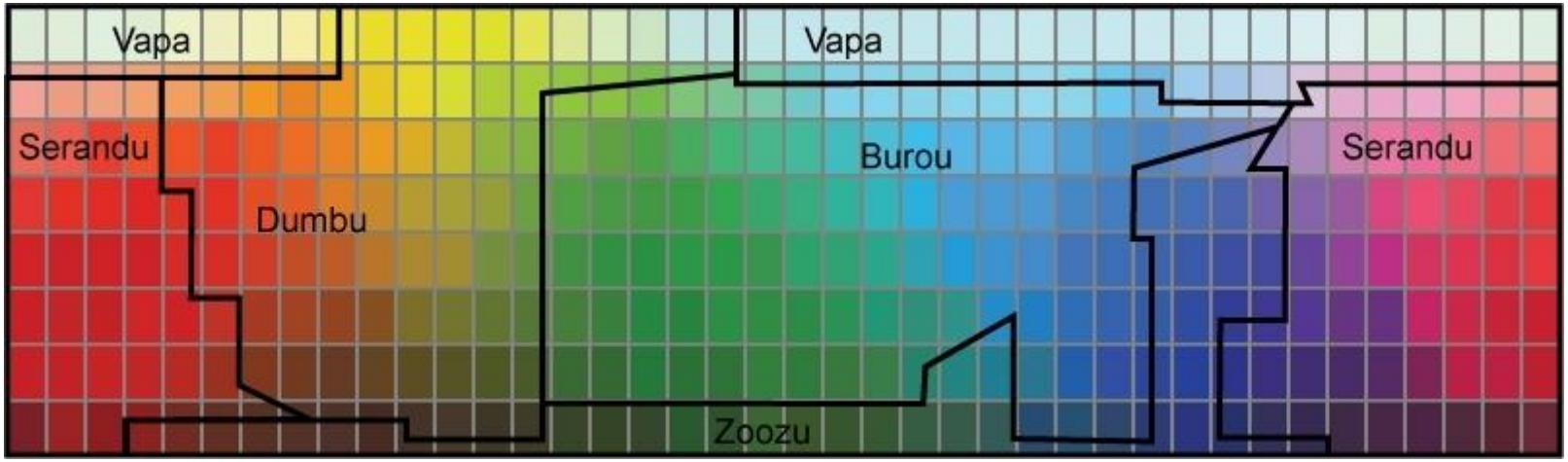
J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

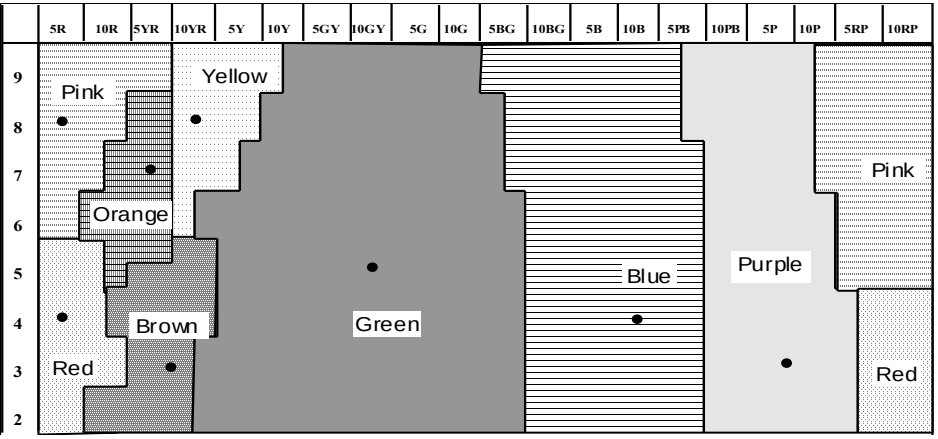
Berinmo



Himba



English



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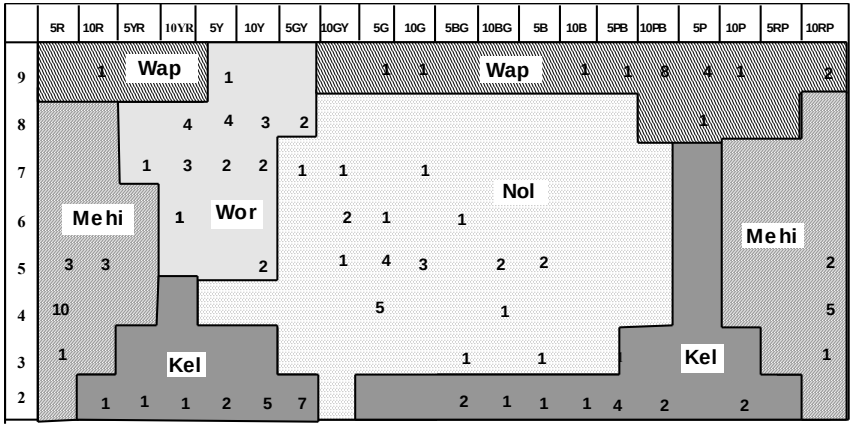

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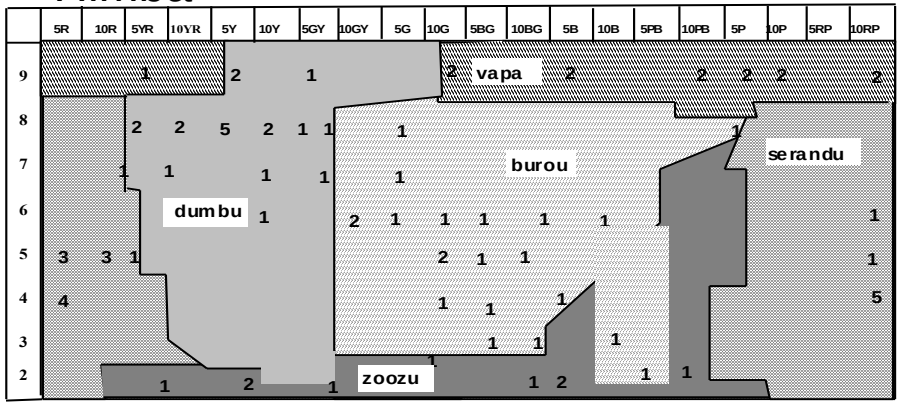
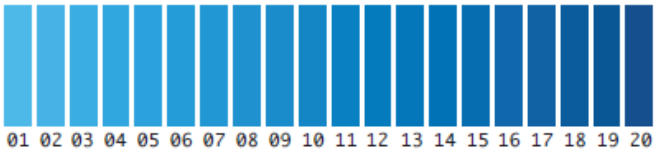


問題

- 言語によって色のバンドのカテゴリー化が異なることは、異なる言語の話者の色の「知覚」が異なることを意味するのか
  - Rosch : Focal Colors
  - Kay & Kempton: Category perception



第2章　右の色と左の色、どちらが上と同じ？

脳はことばを使わなくてもよい時でも勝手にことばにアクセスする

- 色の同異を判断する課題（ことばはいらない）

→色の名前を言う課題で活動する部位（側頭葉と運動野のことばの辞書のアクセスにかかわる部分）が活動する

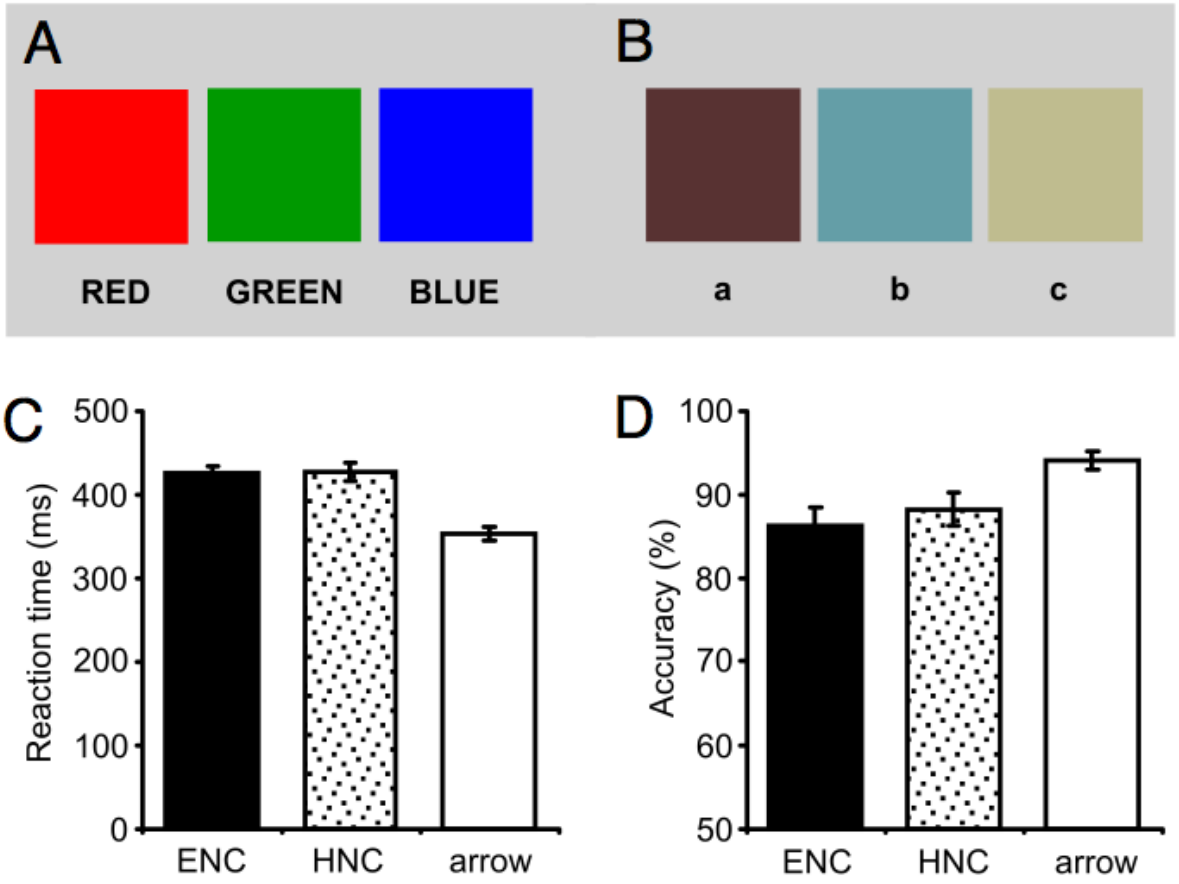


Fig. 1. Experimental materials and behavioral results. (*A* and *B*) Printed-rendered versions of the six colors used. The three colors in *A* are easy-to-name colors, and three colors in *B* are hard-to-name colors. (*C* and *D*) Behavioral performance in the three conditions. In the color discrimination task, there were no significant differences in reaction time or response accuracy between the easy-to-name and hard-to-name colors. Reaction times (for correct responses only) were faster and accuracies were higher for arrow judgment compared with color discrimination. Error bars indicate SE measurement (SEM). ENC, easy-to-name colors; HNC, hard-to-name colors.

Tan et al., 2008 PNAS 105, 4004–4009

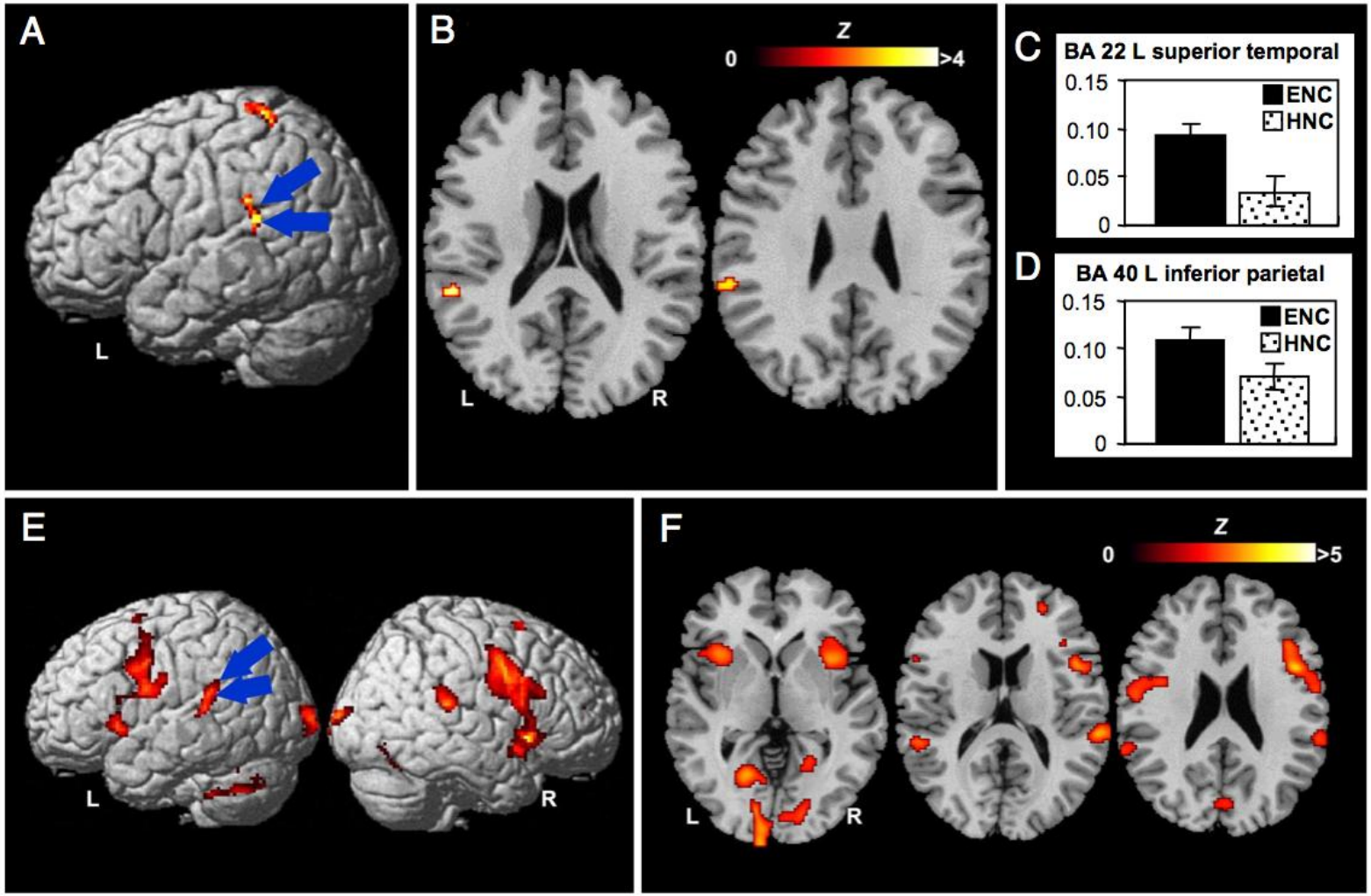


Fig. 3. Brain activations elicited by color perception and explicit color naming. (*A* and *B*) Areas showing significant activation during perceptual discrimination of easy-to-name colors in comparison with perceptual discrimination of hard-to-name colors. *A* and *B* are lateral view and axial sections, respectively. Two regions of greatest interest are the left posterior superior temporal gyrus (BA 22; $x = -57$, $y = -38$, $z = 18$) and the left inferior parietal lobule (BA 40; $x = -61$, $y = -32$, $z = 27$). (*C* and *D*) Percentage BOLD signal change (± SEM) at voxels of maximal difference between the two color-discrimination conditions in the two regions of interest. (*E* and *F*) Areas showing significant activation in explicit color naming against color word naming as baseline. *E* and *F* are lateral view and axial sections, respectively. The left posterior superior temporal gyrus and the left inferior parietal lobule are critically engaged by the color naming task. The significance thresholds are $P < 0.001$ uncorrected for the perceptual discrimination of easy-to-name colors contrasted with the perceptual discrimination of hard-to-name colors and $P < 0.05$ FDR-corrected for color patch naming against word naming. Functional maps shown at axial sections (in color) are overlaid on the corresponding T1 images (in gray scale). Error bars indicate SE of measurement (SEM).

Tan et al., 2008

色のことばの脳活動

- Martin et al., (1995)
- 色の名前とアクションの名前
- 物体の線画を提示してその物体の色あるいはそれに付随したアクションを想起（実験1）
- 色の名前、アクションの名前を文字で提示

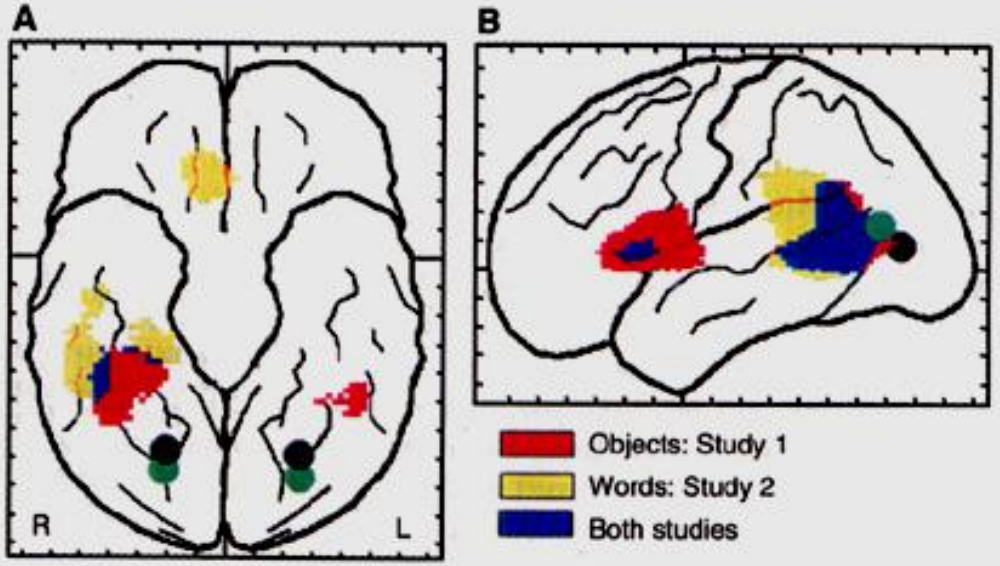


Fig. 2. (**A**) Ventral view of the brain showing regions of increased rCBF when subjects generated color words in comparison to generating action words. (**B**) Lateral view of the left cerebral hemisphere showing regions of increased rCBF when subjects generated action words in comparison to generating color words. Red indicates activations in response to line drawings of objects; yellow indicates activations in response to the written names of the objects; and blue indicates regions activated in both studies. Also shown are black (9) and green (*10*) circles centered on previously reported locations of maximum activity during the perception of color (A) and of motion (B). Maximum peaks of activity during color word generation (A) were in the fusiform gyri of the left (−42, −46, −12) and right (+42, −42, −20) temporal lobes for the object study, and the fusiform (+50, −38, −12) and parahippocampal gyri (+28, −30, −16) of the right temporal lobe, and orbital frontal cortex (+12, +26, −12) for the word study (*29*). For action word generation (B) peak activations were in the left inferior frontal lobe (Broca's area) (−44, +6, +4; and −42, +18, +4), and in the middle (−50, −50, +4; and −54, −62, +8) and superior (−50, −52, +24; and −54, −38, +20) left temporal gyri during the object and word studies, respectively (*30*). Shown are all pixels that exceeded a threshold of $Z = 2.58$ ($P < 0.005$, one-tailed).

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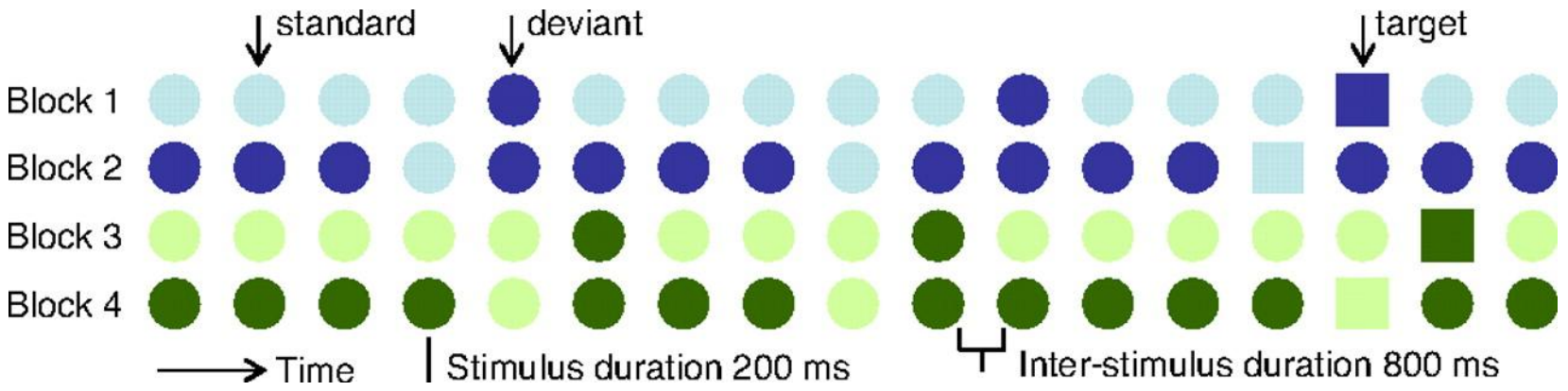
Discrete Cortical Regions Associated with Knowledge of Color and Knowledge of Action

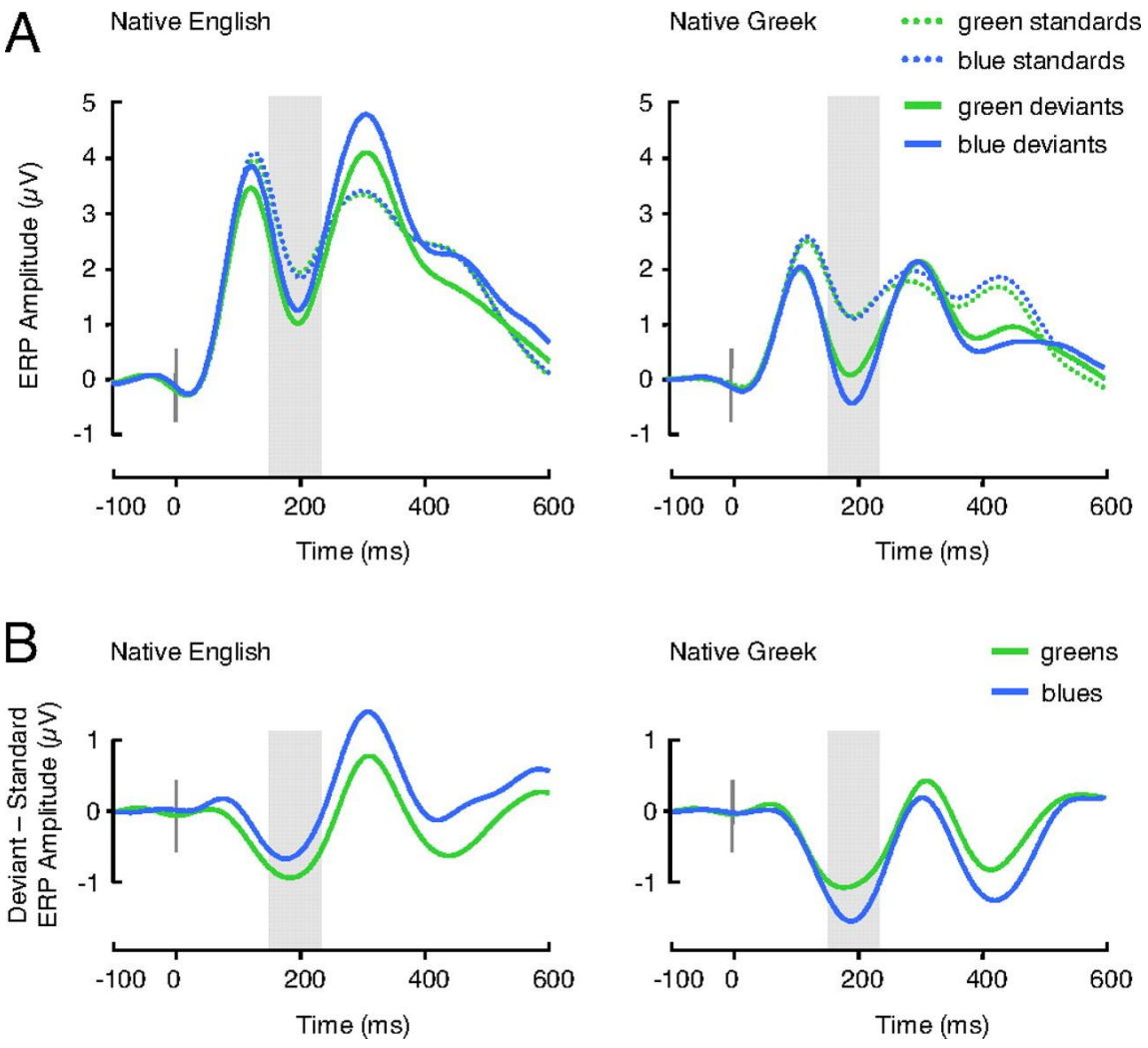
Martin, Haxby, Lalonde, Wiggs and Ungerleider

Experimental design and sample of stimulus sequences presented in the 4 experimental blocks



Thierry G. et.al. PNAS 2009;106:4567-4570

Event-related potential (ERP) results



Thierry G. et.al. PNAS 2009;106:4567-4570

視野によるカテゴリー知覚の違い

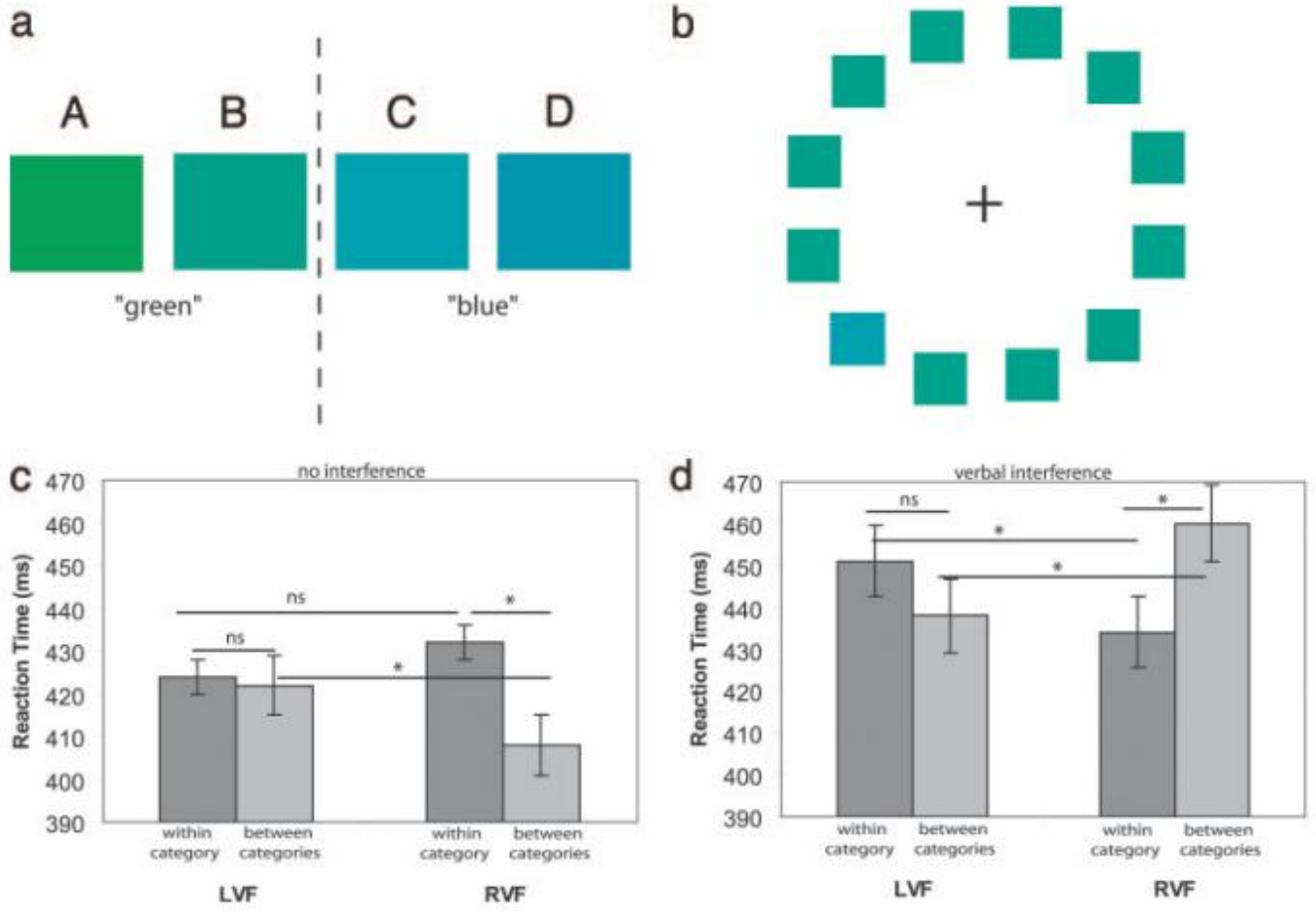


Fig. 1. Lexical categories influence perception in the RVF. (*a*) Print-rendered versions of the four colors used. (*b*) Sample display for the visual search task. Participants were required to press one of two response keys, indicating the side containing the target color. (*c*) In the no-interference condition, RTs were faster for the between-category pair and slower for the within-category pairs when targets appeared in the RVF compared with when they appeared in the LVF. (*d*) Effects were reversed with verbal interference. *, $P < 0.05$, two-tailed *t* test, $df = 10$; ns, nonsignificant. Values are mean ± SEM.

Guillbert, Regier, Kay & Ivry, PNAS **2006 vol. 103 no. 2 489–494**

Outstanding questions

- 「知覚」と「認識」は同じレベルで説明するべきなのか、違うレベルでするべきなのか
  - Cf.「意識」とは何か
- 心のレベルでの「言語相対性」は脳のレベルではどのようにして説明できるのか
- 動物ベースの知覚（＆記憶）の脳モデルはヒトの知覚モデルとしてどこまでapplicableなのか