

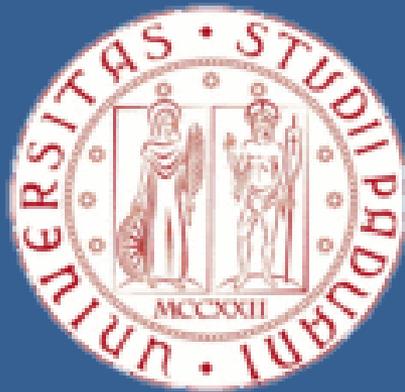
# DISLESSIA 2018

## UPDATE DEI DISTURBI DELL'APPRENDIMENTO

4 OTTOBRE 2018

Auditorium Ospedale Pediatrico Bambino Gesù  
viale Ferdinando Baldelli 38, Roma

ORGANIZZATORI: **Stefano Vicari e Deny Menghini**



Intervento e trattamento

Andrea Facoetti



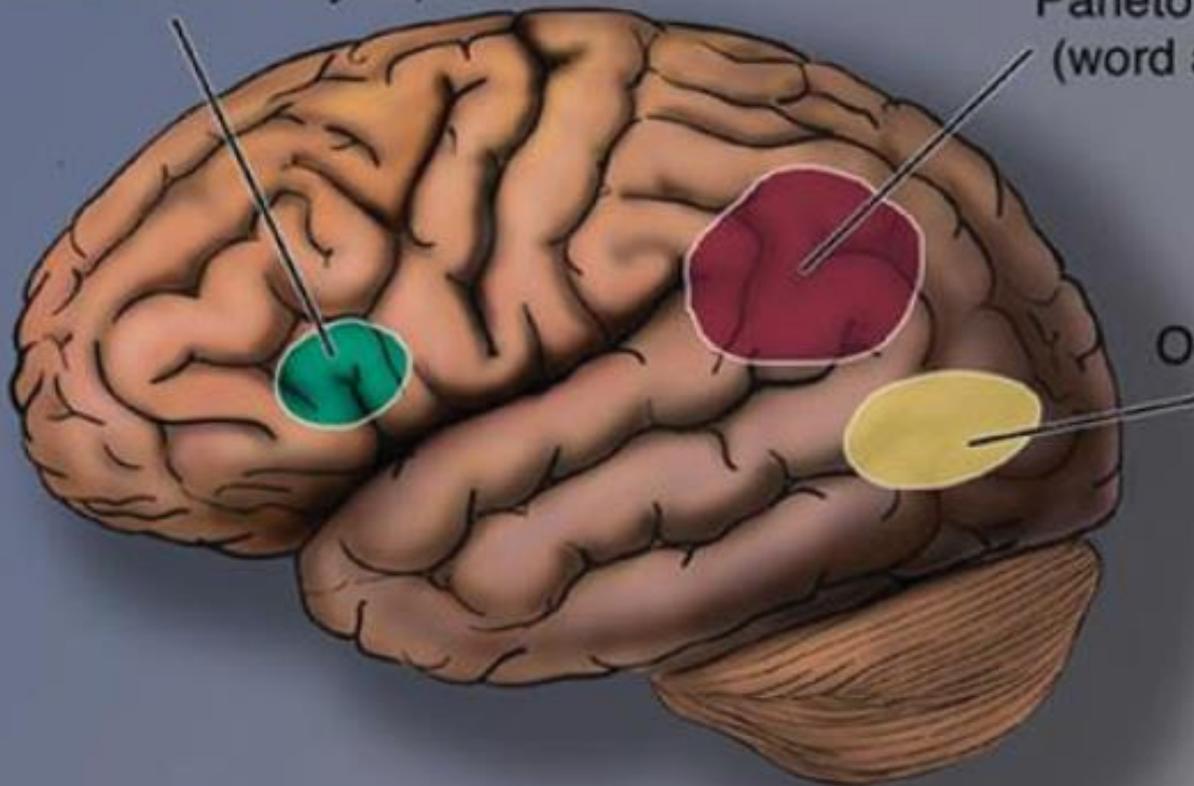
*Laboratorio di Neuroscienze Cognitive dello Sviluppo  
Dipartimento di Psicologia Generale,  
Università di Padova*

# Neurobiologia della Lettura

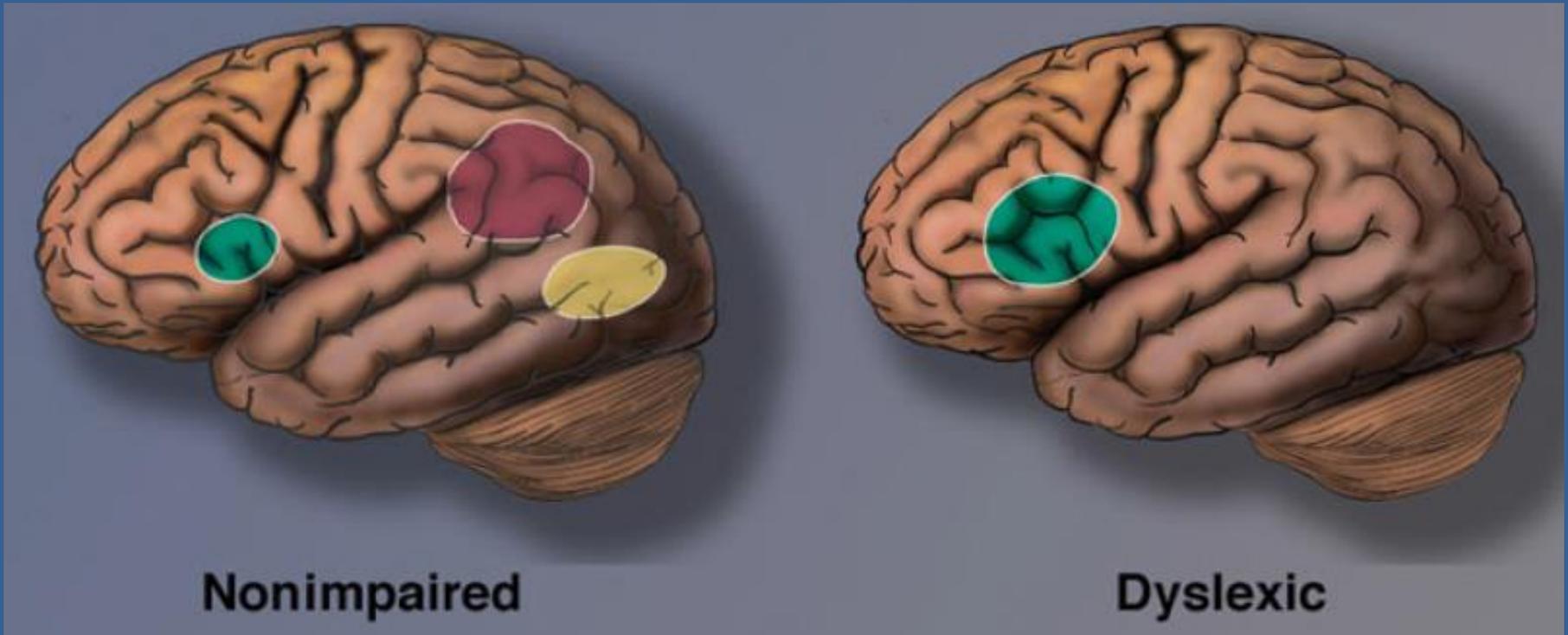
Broca's area  
Inferior frontal gyrus  
(articulation/word analysis)

Parietotemporal  
(word analysis)

Occipitotemporal  
(word form)



# Deficit **Fonologici** e **Ortografici** nella dislessia: Cause o Effetti?



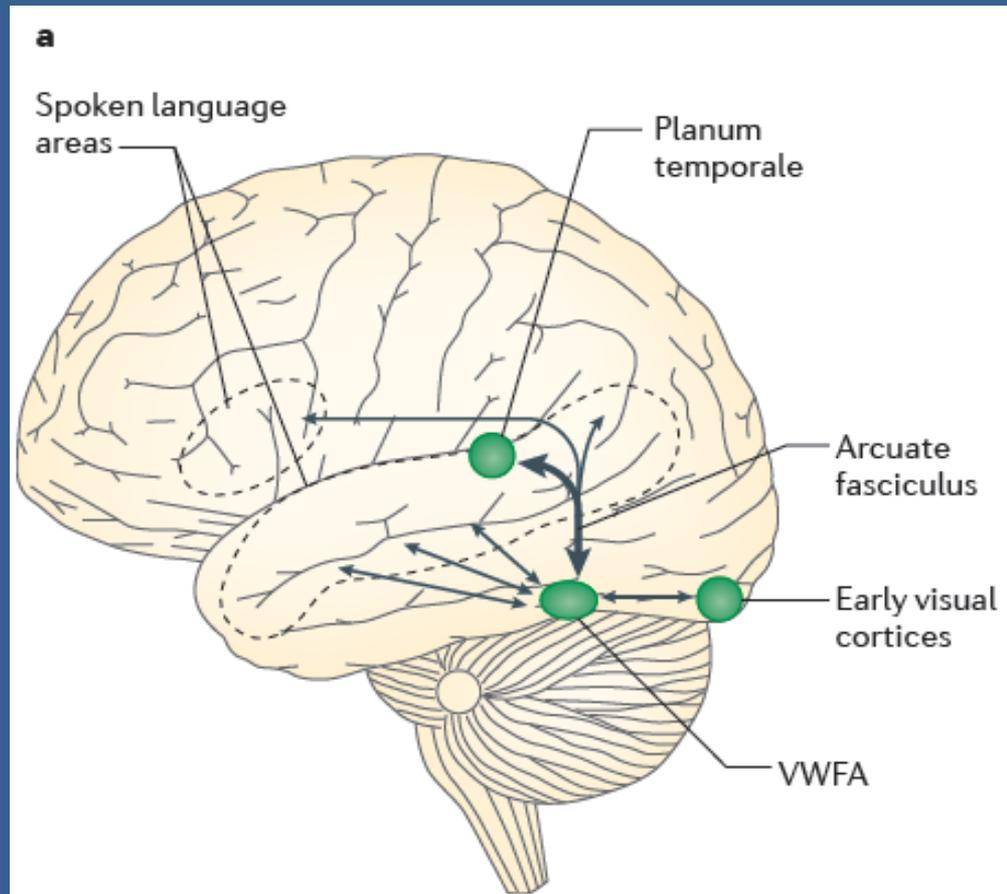
Oppure, quali sono le cause dei deficit **Fonologici** e **Ortografici** deficit nella dislessia?

# Illiterate to literate: behavioural and cerebral changes induced by reading acquisition

*Stanislas Dehaene, Laurent Cohen, José Morais and Régine Kolinsky*

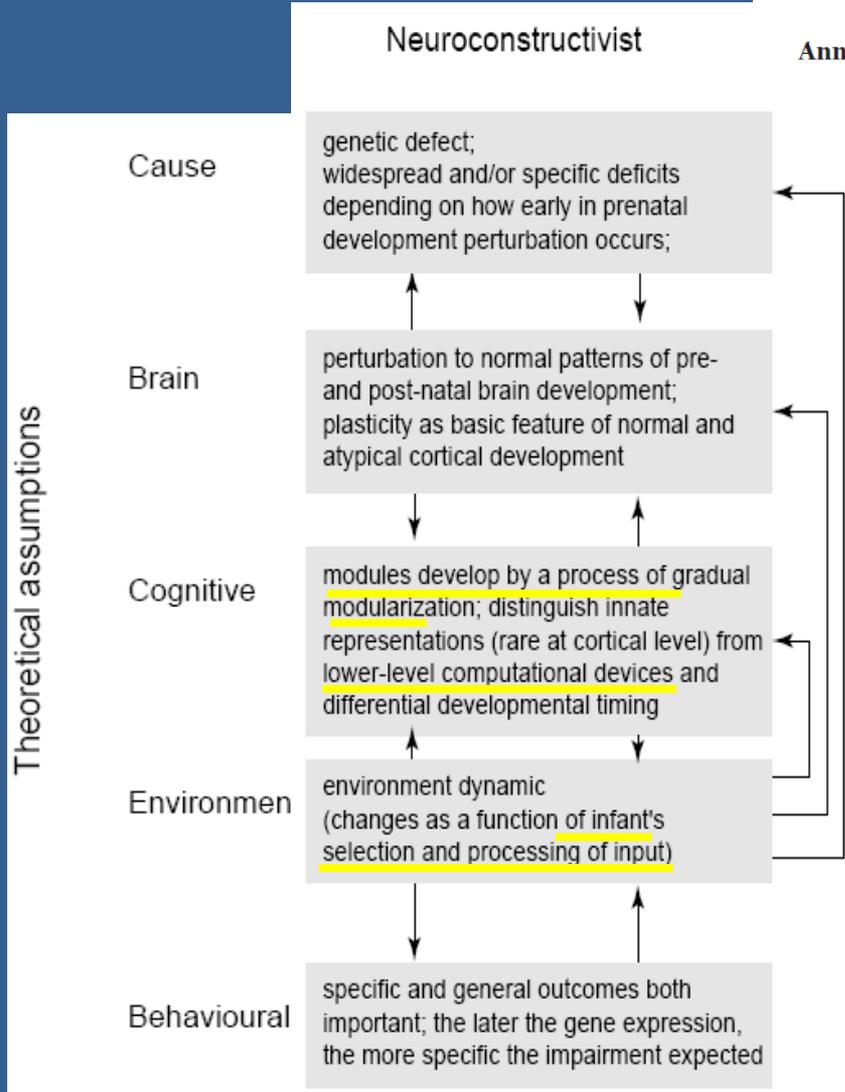
**Abstract** | The acquisition of literacy transforms the human brain. By reviewing studies of illiterate subjects, we propose specific hypotheses on how the functions of core brain systems are partially reoriented or 'recycled' when learning to read. Literacy acquisition improves early visual processing and reorganizes the ventral occipito-temporal pathway: responses to written characters are increased in the left occipito-temporal sulcus, whereas responses to faces shift towards the right hemisphere. Literacy also modifies phonological coding and strengthens the functional and anatomical link between phonemic and graphemic representations. Literacy acquisition therefore provides a remarkable example of how the brain reorganizes to accommodate a novel cultural skill.

# Deficit Fonologici e Ortografici nella dislessia: Cause o Effetti?



# Development itself is the key to understanding developmental disorders

Annette Karmiloff-Smith

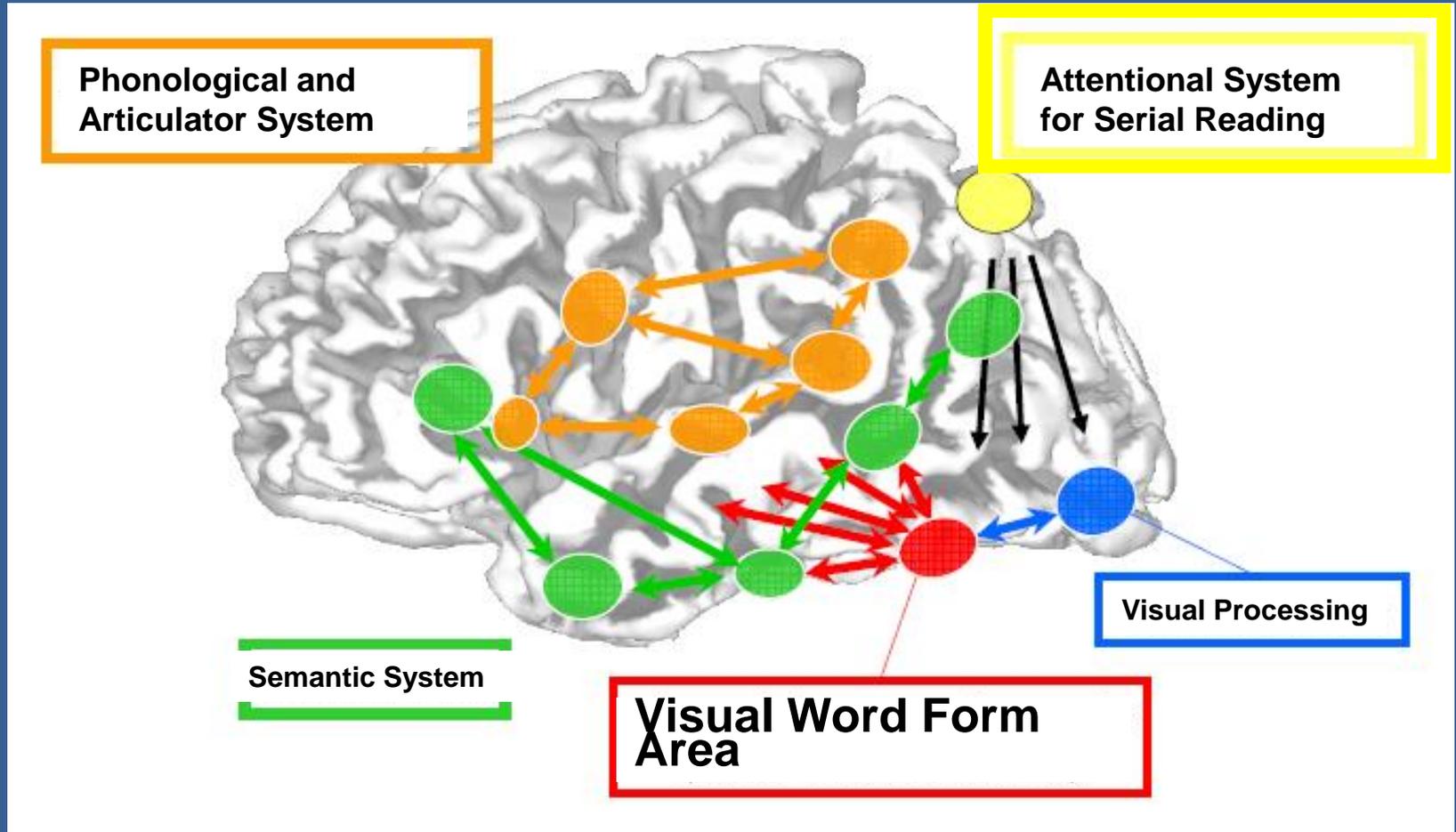


Oppure, quali sono le cause dei deficit **Fonologici** e **Ortografici** deficit nella dislessia?



# *La Visione Emergente*

The model by Dehaene, Cohen & coll.



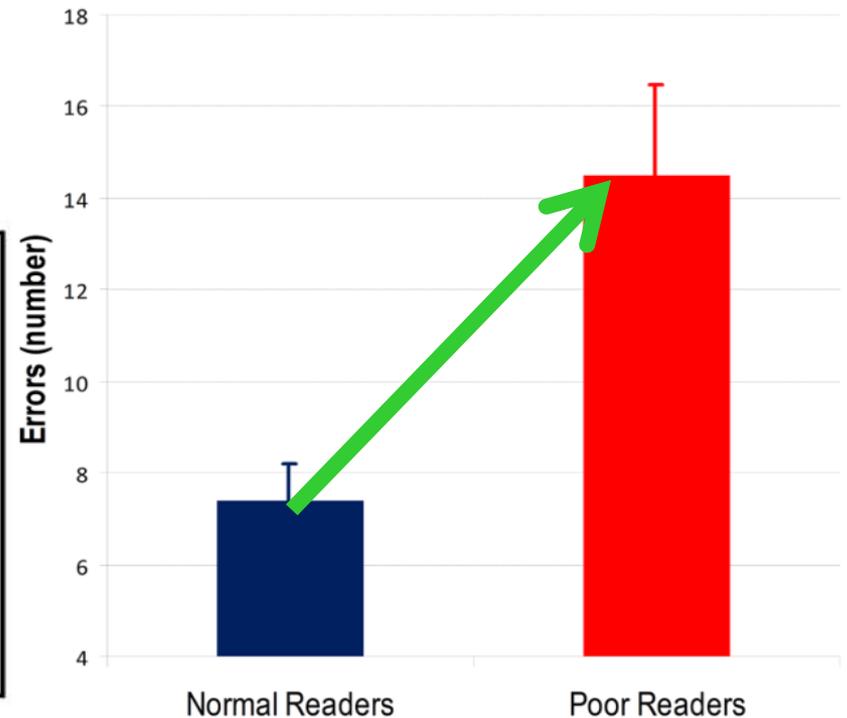
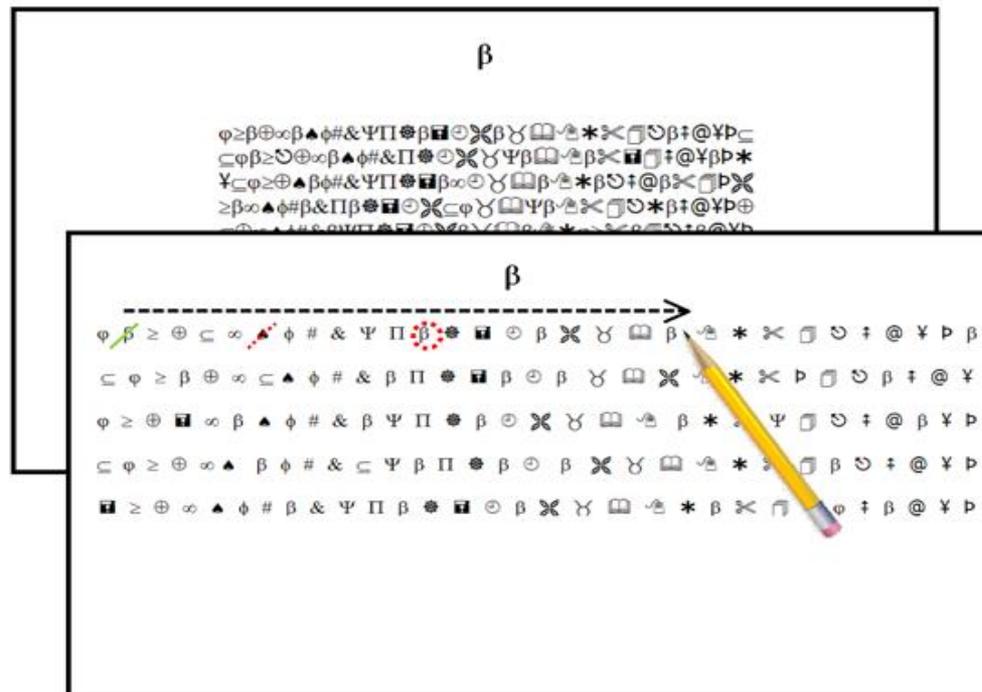
# Prevedere la Dislessia

# 1. PREVEDERE LA DISLESSIA misurando l'attenzione visuo-spaziale

Current Biology 22, 814–819, May 8, 2012

Report

## A Causal Link between Visual Spatial Attention and Reading Acquisition



# 2. PREVEDERE LA DISLESSIA misurando il circuito dorsale-attenzionale

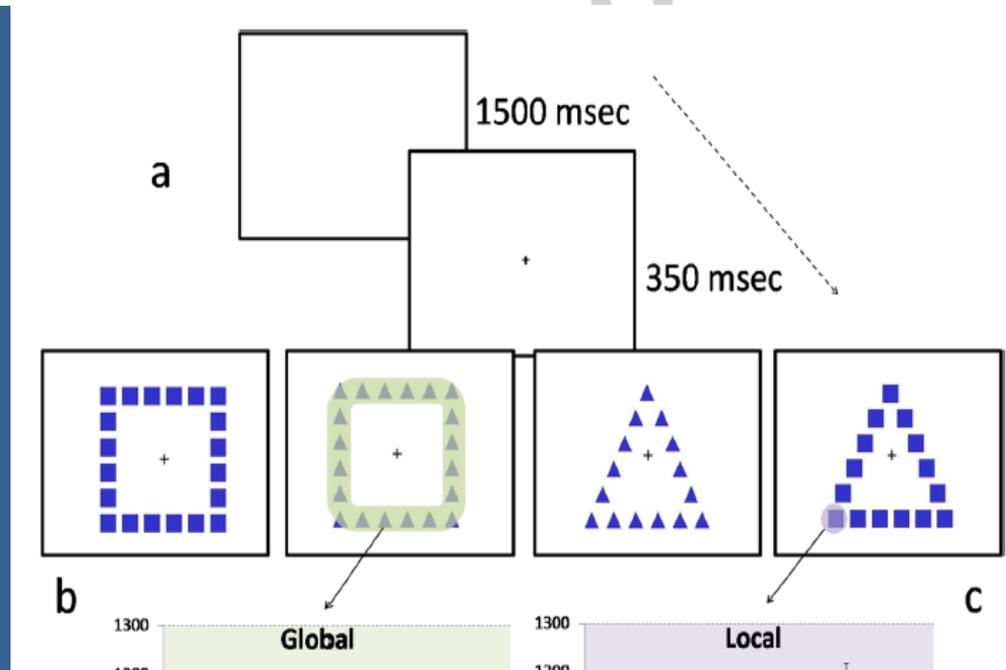
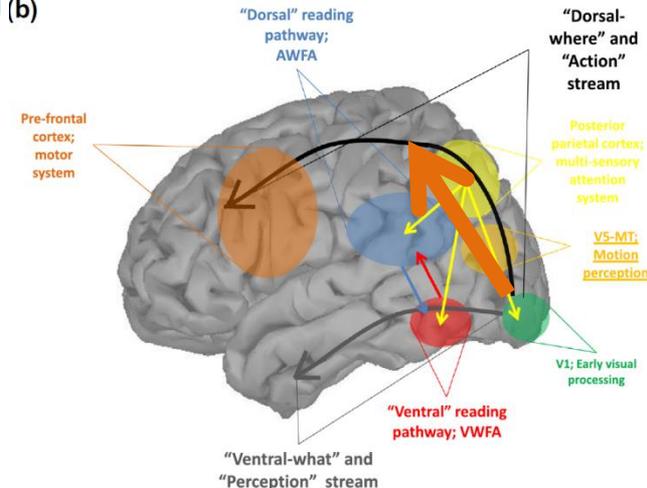
www.nature.com/scientificreports (b)

## SCIENTIFIC REPORTS

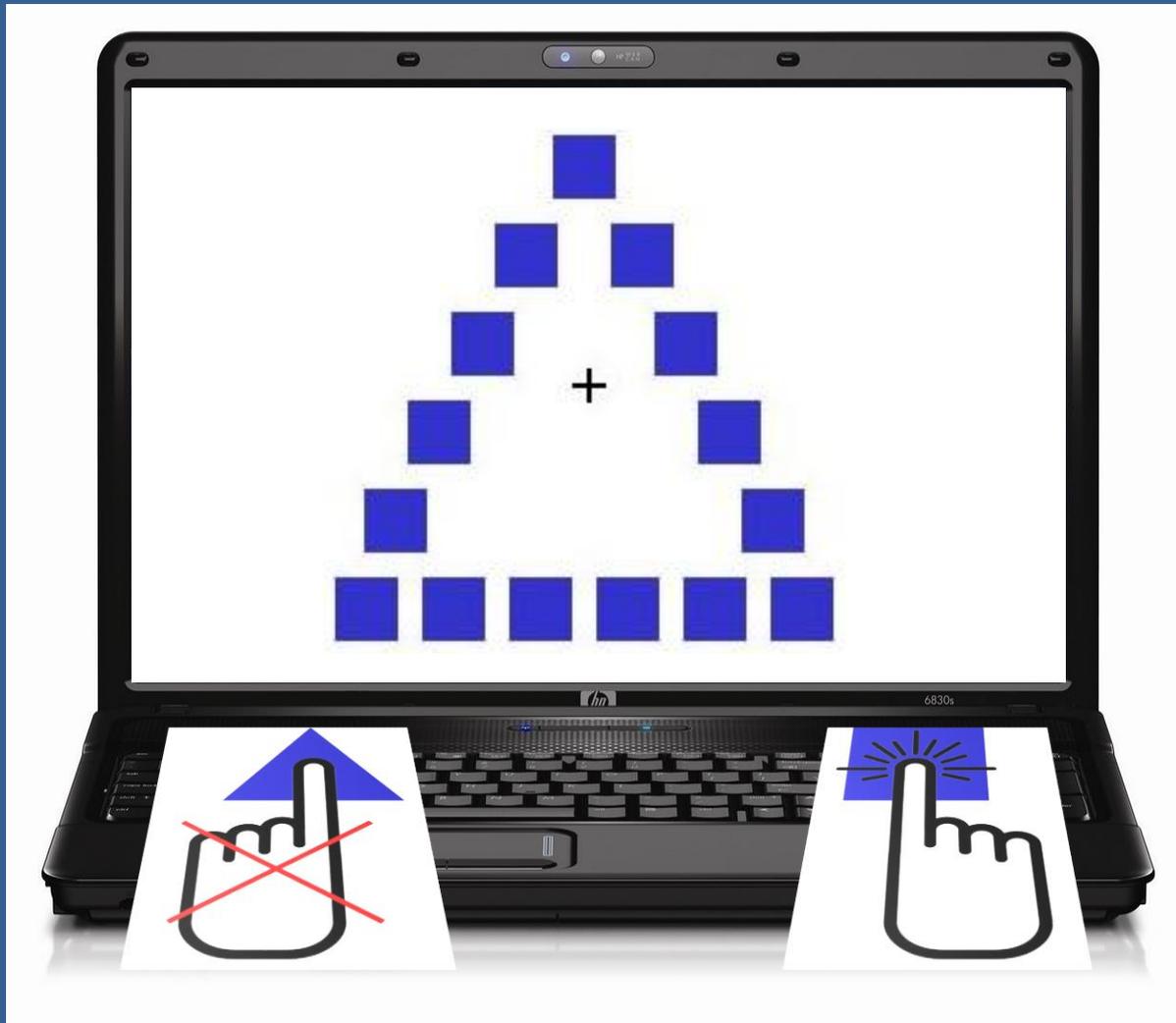
OPEN

### A different vision of dyslexia: Local precedence on global perception

Sandro Franceschini<sup>1,2</sup>, Sara Bertoni<sup>1</sup>, Tiziana Giancesini<sup>3</sup>, Simone Gori<sup>4</sup> & Andrea Facoetti



# Compito di Navon: e.g., Livello Locale



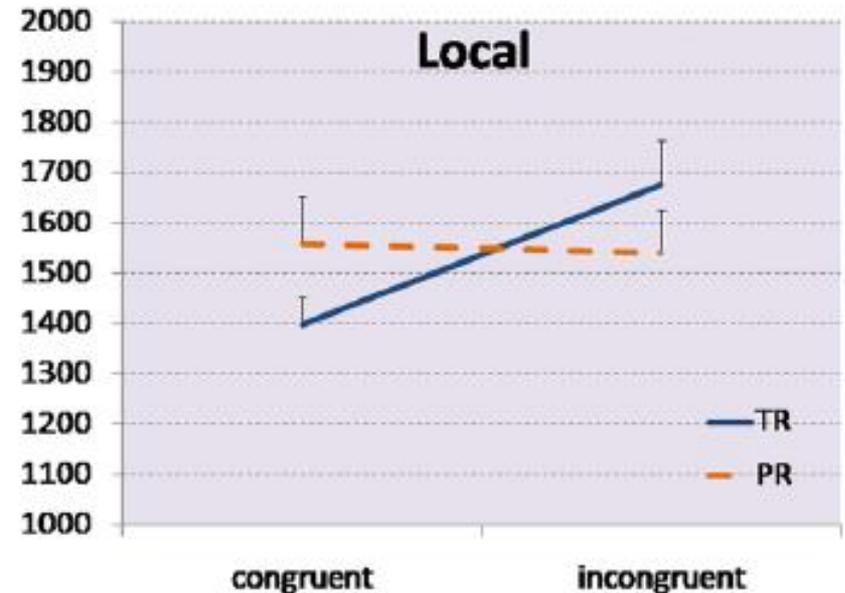
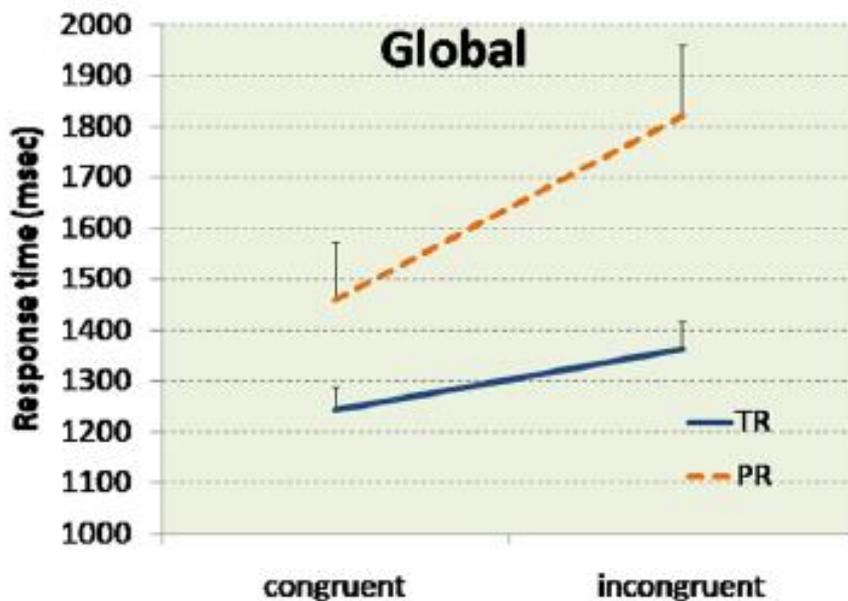
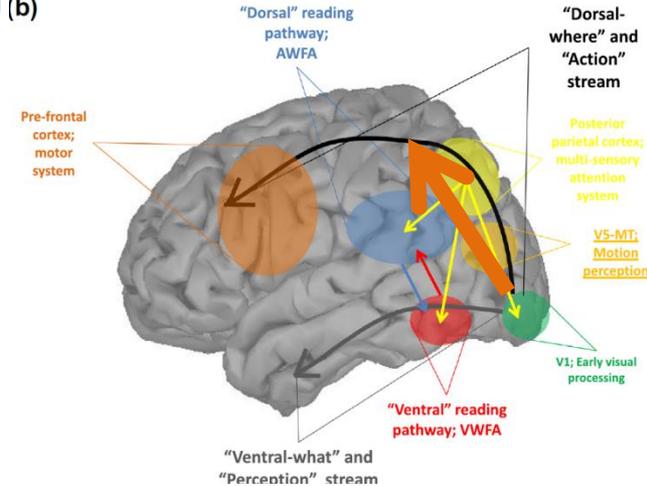
# 2. PREVEDERE LA DISLESSIA misurando il circuito dorsale-attenzionale

www.nature.com/scientificreports (b)

## SCIENTIFIC REPORTS

### OPEN A different vision of dyslexia: Local precedence on global perception

Sandro Franceschini<sup>1,2</sup>, Sara Bertoni<sup>1</sup>, Tiziana Giancesini<sup>3</sup>, Simone Gori<sup>4</sup> & Andrea Facoetti



# 3. PREVEDERE LA DISLESSIA misurando il circuito dorsale-attenzionale

Cerebral Cortex Advance Access published October 6, 2015

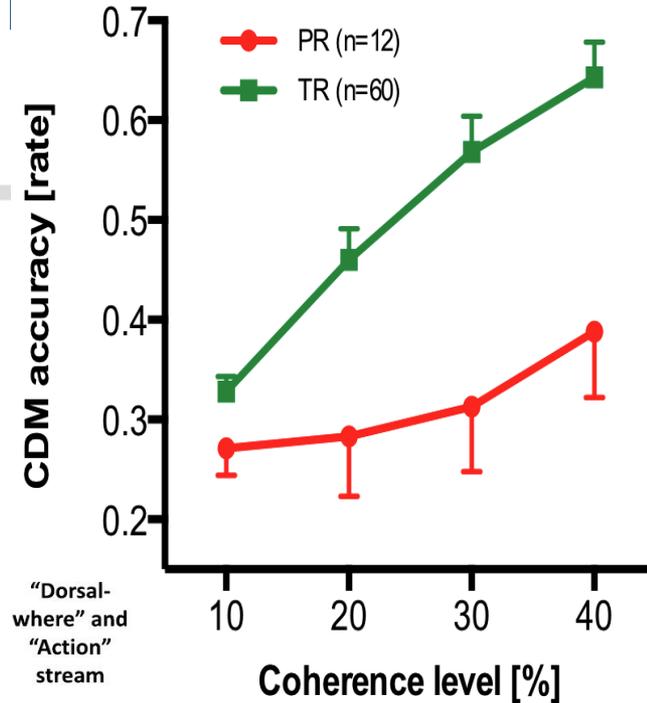
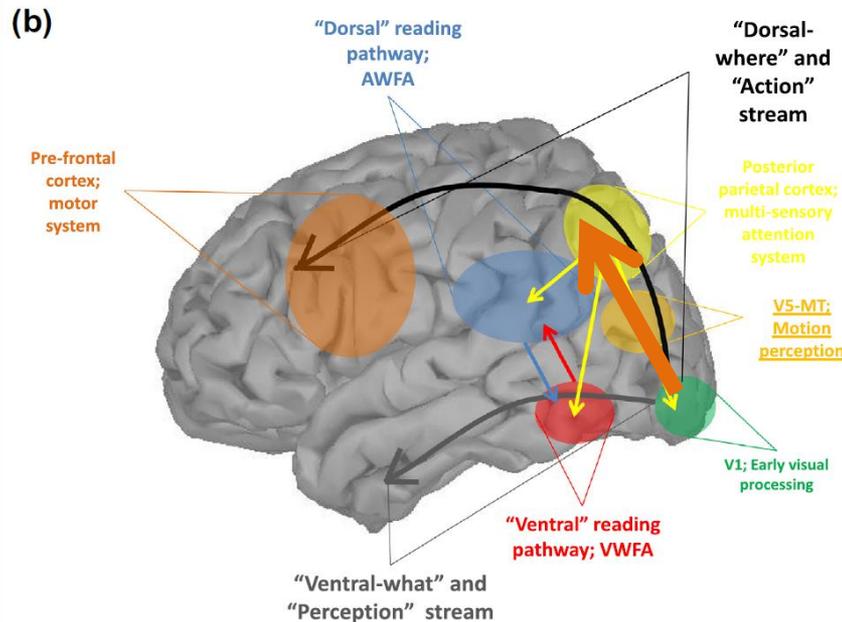


*Cerebral Cortex*, 2015, 1–14

doi: 10.1093/cercor/bhv206  
Original Article

ORIGINAL ARTICLE

## Multiple Causal Links Between Magnocellular–Dorsal Pathway Deficit and Developmental Dyslexia



# Trattamento della Dislessia

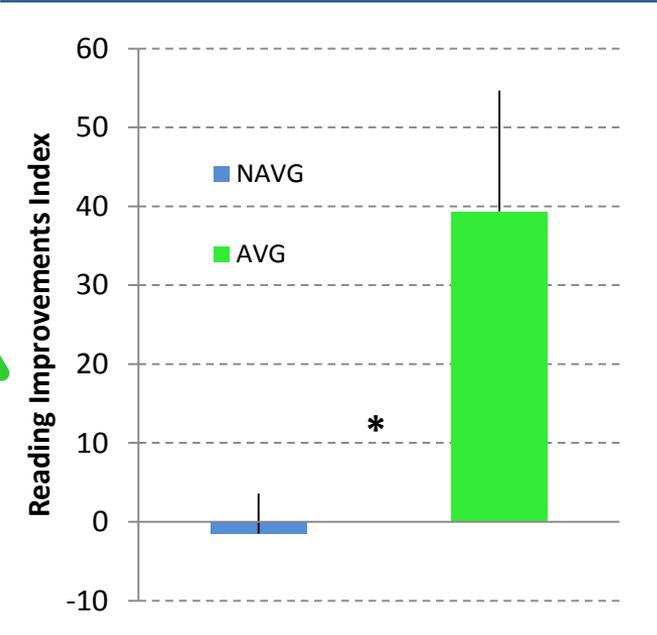
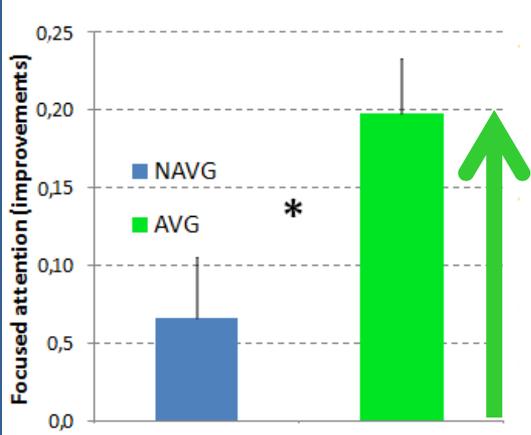
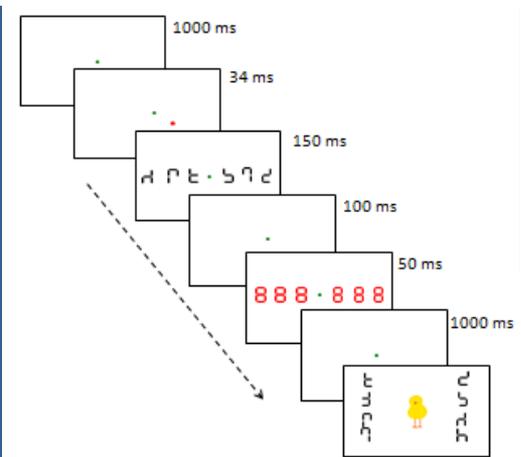
# 4. MIGLIORARE la Lettura nei bambini con DISLESSIA

## RIDUCENDO i loro disturbi visuo-attenzionale

Current Biology 23, 1–5, March 18, 2013 <http://dx.doi.org/10.1016/j.cub.2013.01.044>

Report

### Action Video Games Make Dyslexic Children Read Better



# Esiste una relazione tra miglioramenti nella lettura e i miglioramenti attenzionali

	Miglioramenti della lettura	
	R <sup>2</sup> Change	P
1. Età e QI	0.026	.80
2. Variazioni Fonologiche	.01	.75
<b><u>3. Miglioramenti attenzionali</u></b>	<b><u>.48</u></b>	<b><u>.03</u></b>

# SCIENTIFIC REPORTS



OPEN

## Action video games improve reading abilities and visual-to-auditory attentional shifting in English-speaking children with dyslexia

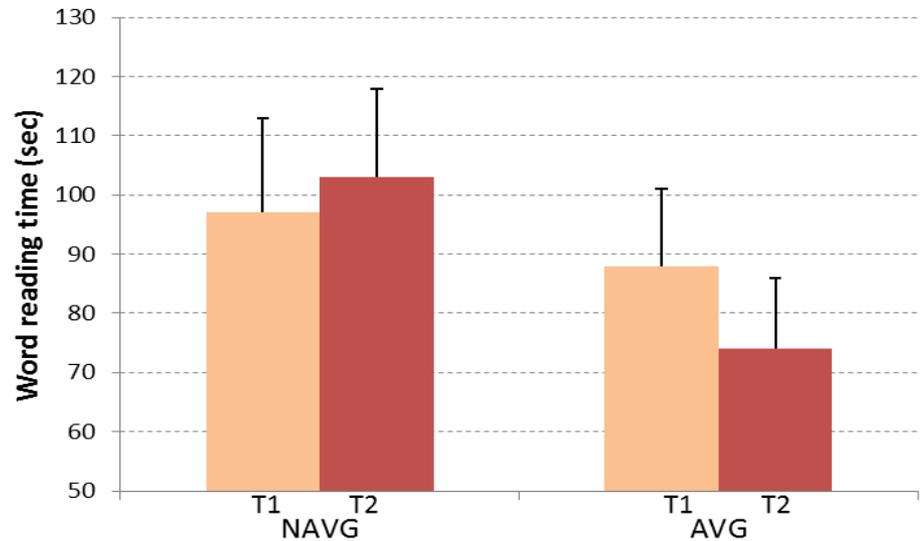
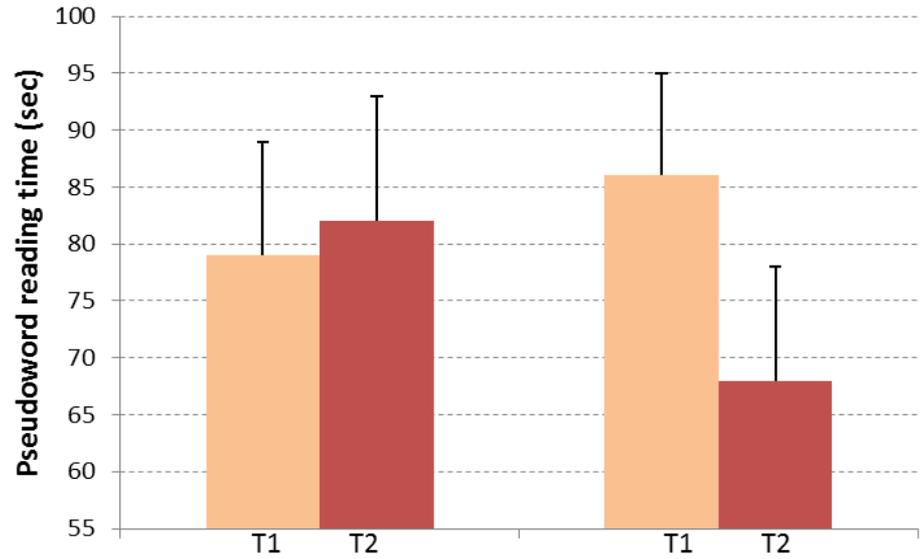
Received: 25 January 2017

Accepted: 2 June 2017

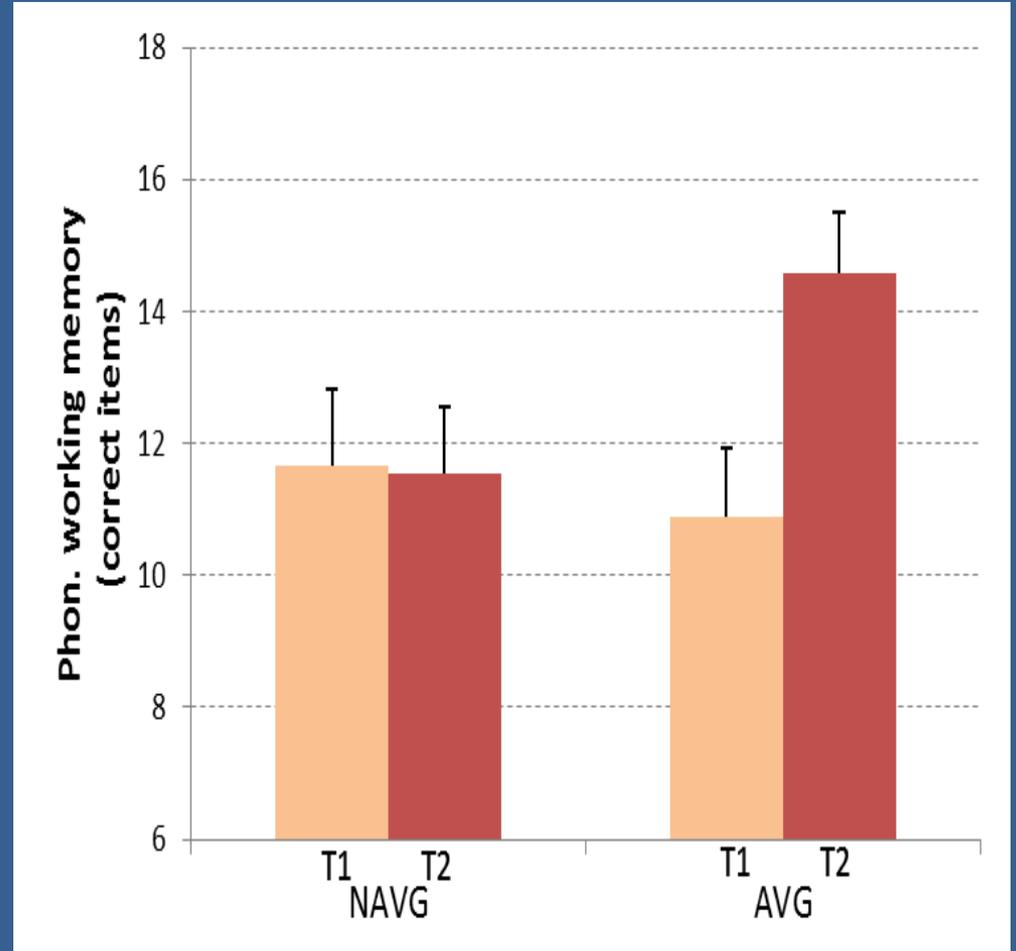
Published online: 19 July 2017

Sandro Franceschini<sup>1,2</sup>, Piergiorgio Trevisan<sup>3</sup>, Luca Ronconi<sup>1,2,4</sup>, Sara Bertoni<sup>1</sup>, Susan Colmar<sup>5</sup>, Kit Double<sup>5</sup>, Andrea Facoetti<sup>1,2</sup> & Simone Gori<sup>2,6</sup>

# Velocità di Lettura



# Memoria di Lavoro Fonologica



# 5. MIGLIORARE LA LETTURA nei bambini con dislessia MIGLIORANDO L'EFFICIENZA del circuito dorsale-attenzionale

Cerebral Cortex Advance Access published October 6, 2015

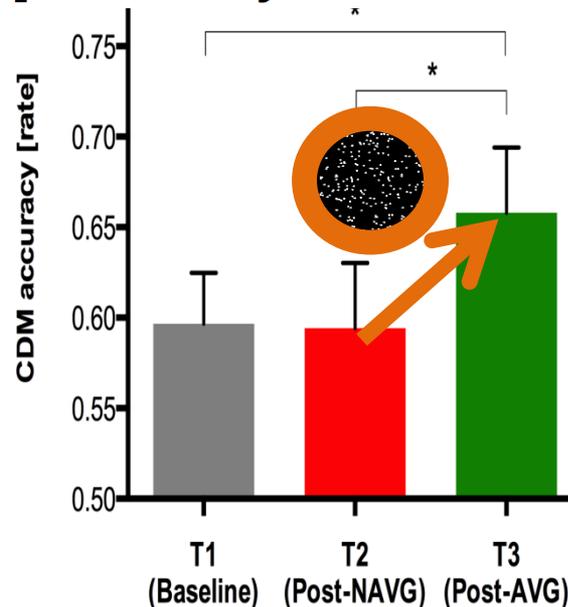
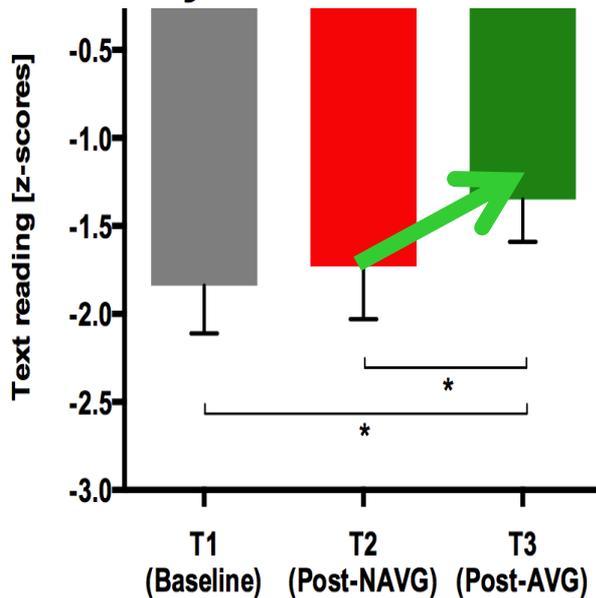


*Cerebral Cortex*, 2015, 1–14

doi: 10.1093/cercor/bhv206  
Original Article

ORIGINAL ARTICLE

## Multiple Causal Links Between Magnocellular–Dorsal Pathway Deficit and Developmental Dyslexia

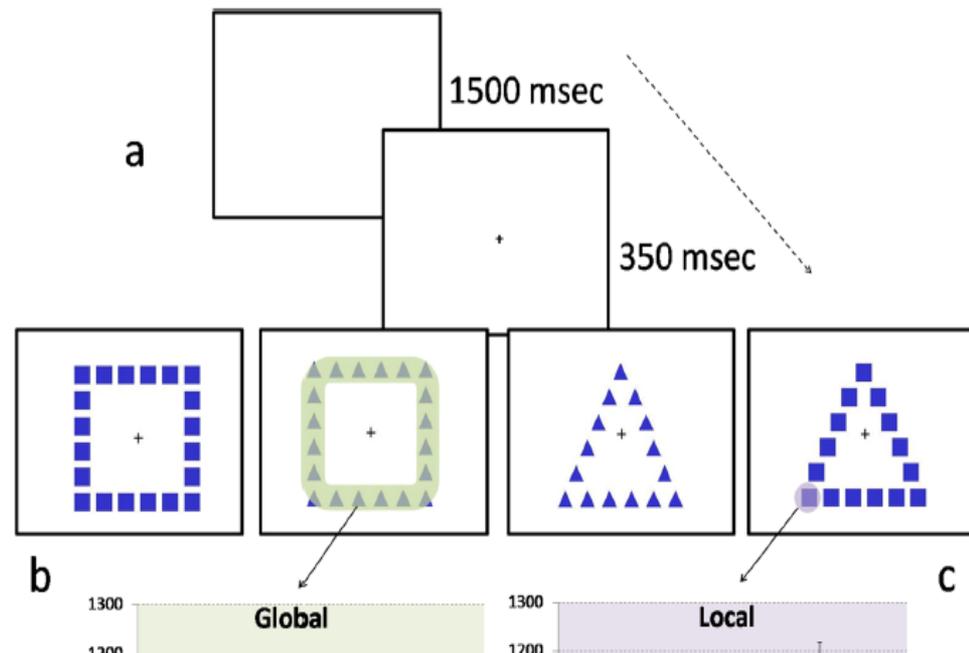
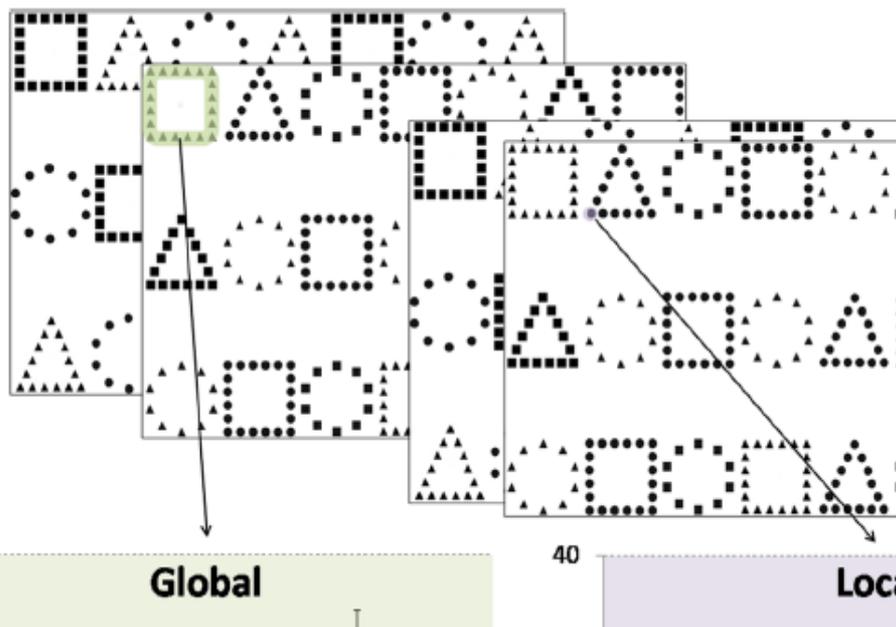


# SCIENTIFIC REPORTS

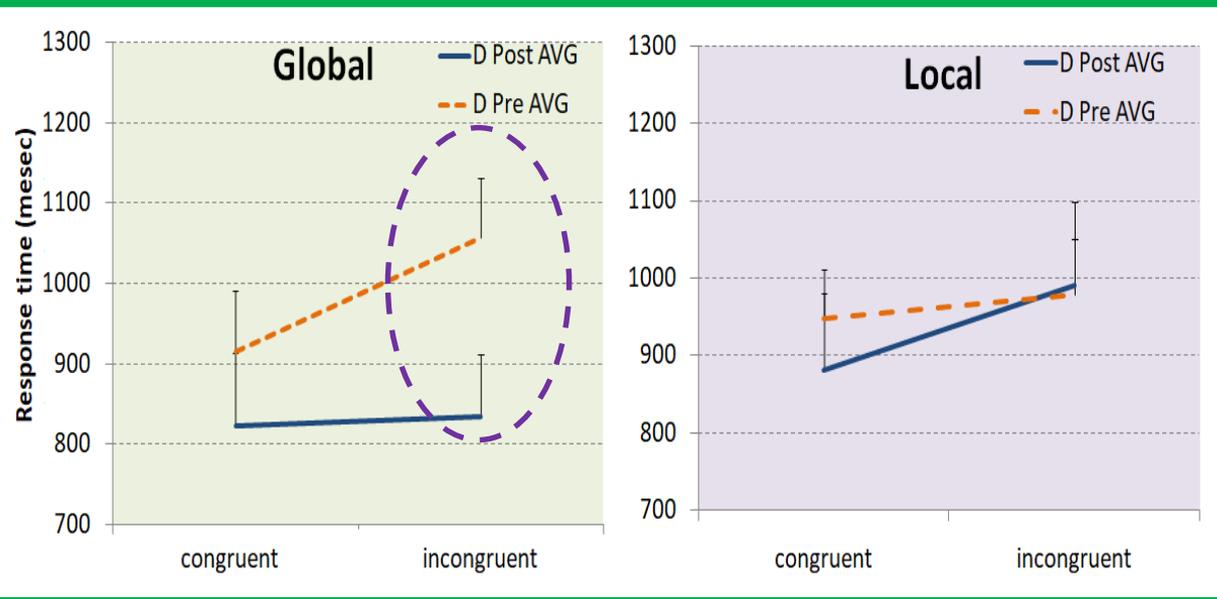
OPEN

## A different vision of dyslexia: Local precedence on global perception

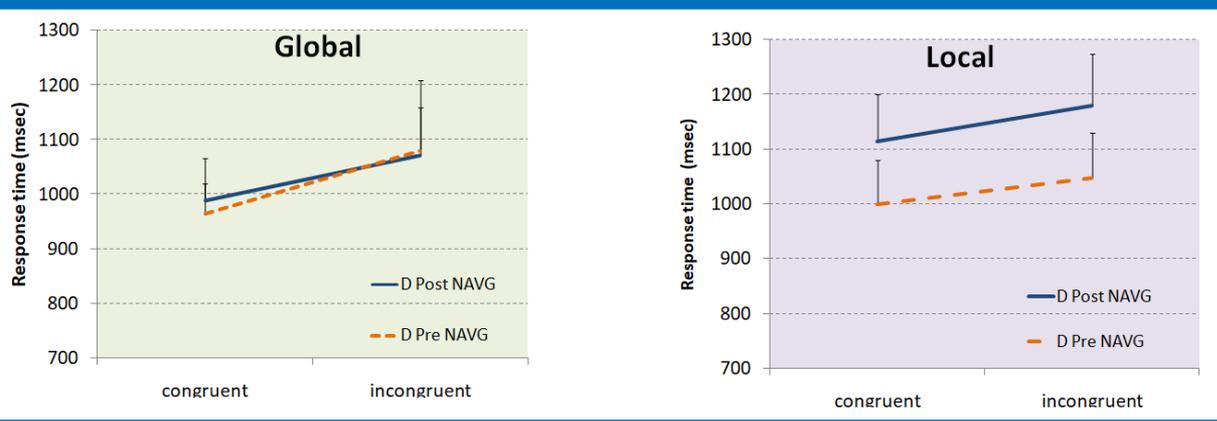
Sandro **Franceschini**<sup>1,2</sup>, Sara **Bertoni**<sup>1</sup>, Tiziana **Gianesini**<sup>3</sup>, Simone **Gori**<sup>4</sup> & Andrea **Facoetti**



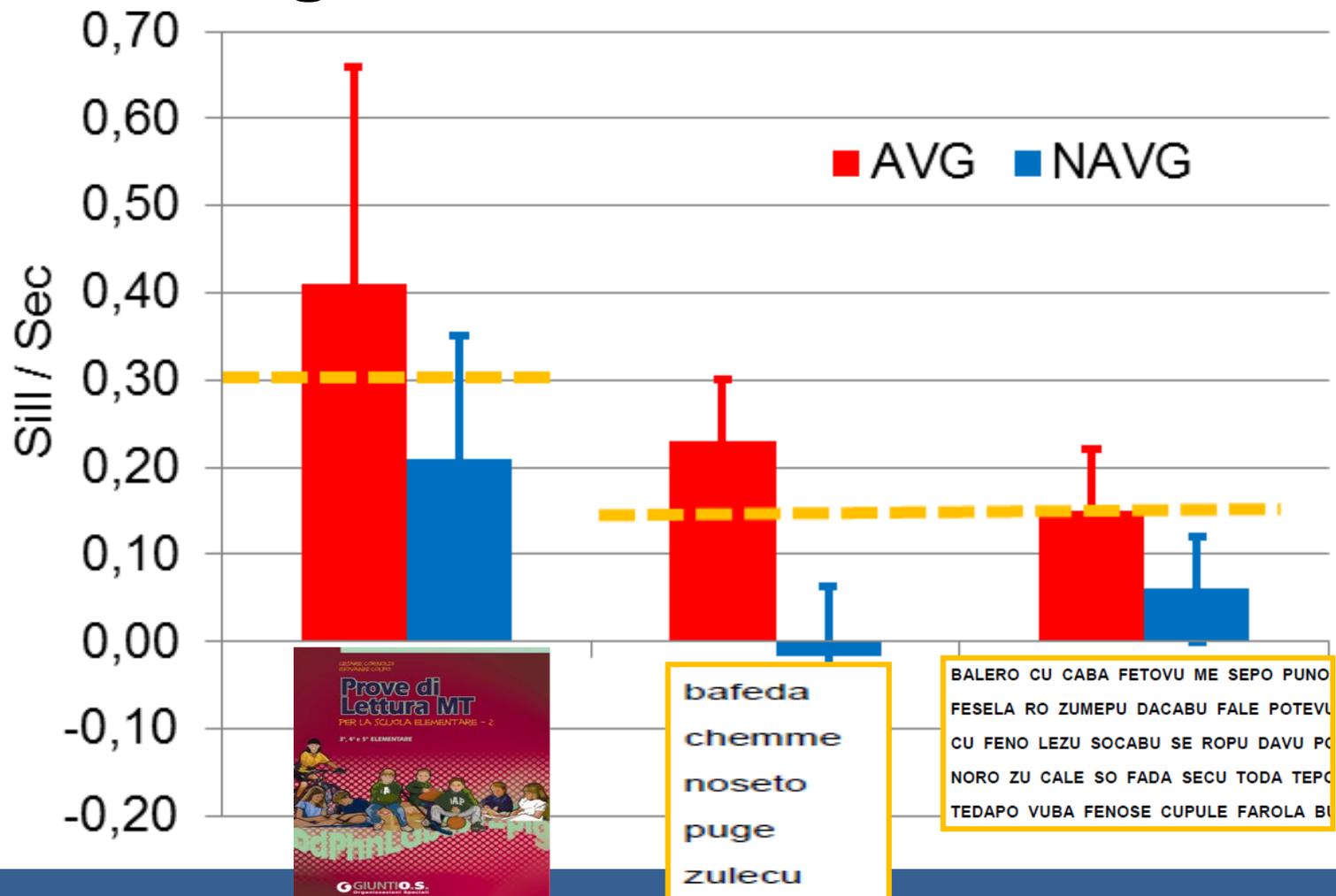
# AVG



# NAVG



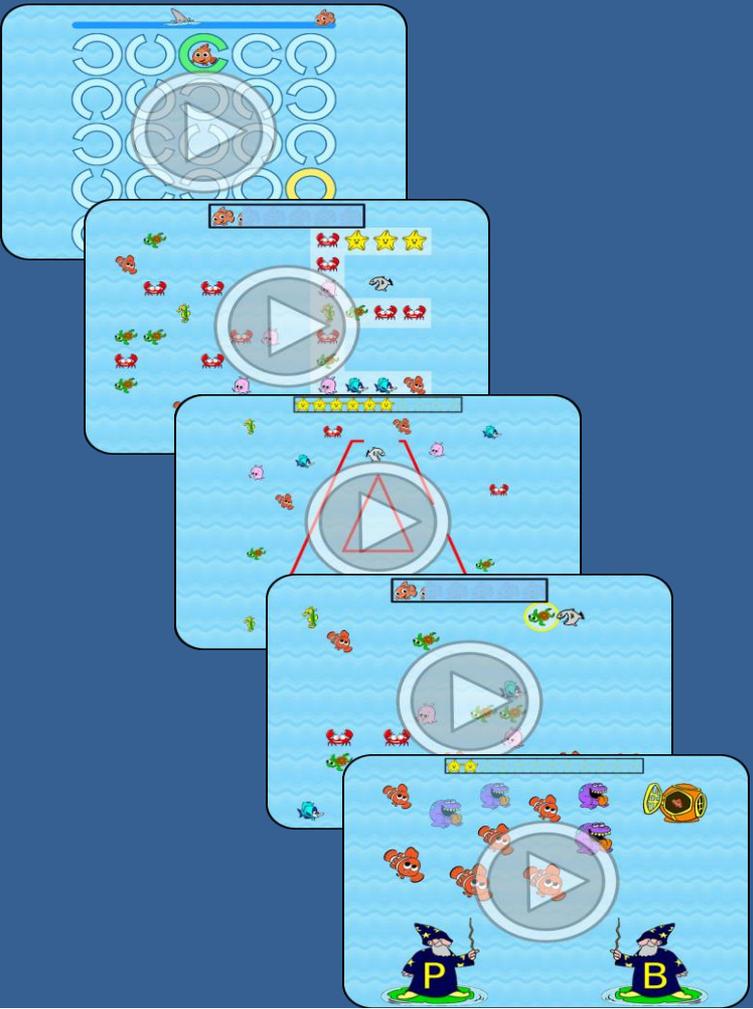
# Miglioramenti nella Lettura



bafeda  
chemme  
noseto  
puge  
zulecu  
lacento  
vurocaio

BALERO CU CABA FETOVU ME SEPO PUNO  
FESELA RO ZUMEPU DACABU FALE POTEVU  
CU FENO LEZU SOCABU SE ROPU DAVU PO  
NORO ZU CALE SO FADA SECU TODA TEPC  
TEDAPO VUBA FENOSE CUPULE FAROLA BI

# Prevenzione della Dislessia

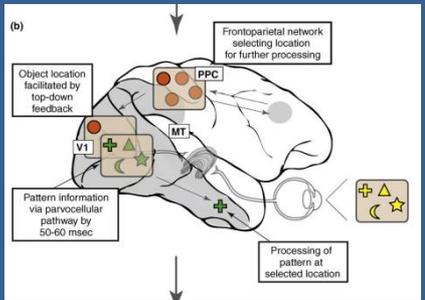


# A Serious Game for Predicting the Risk of Developmental Dyslexia in Pre-readers Children

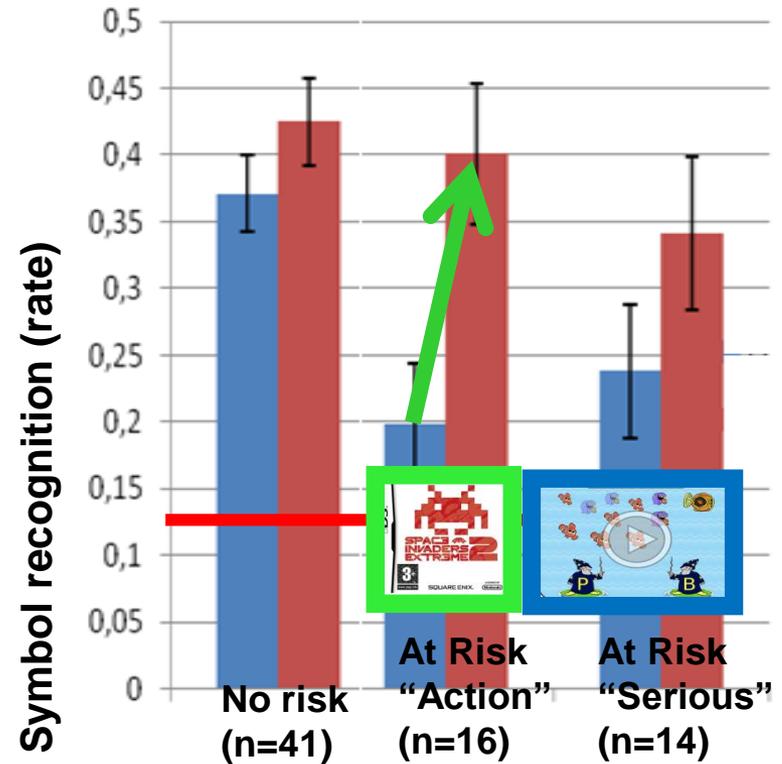
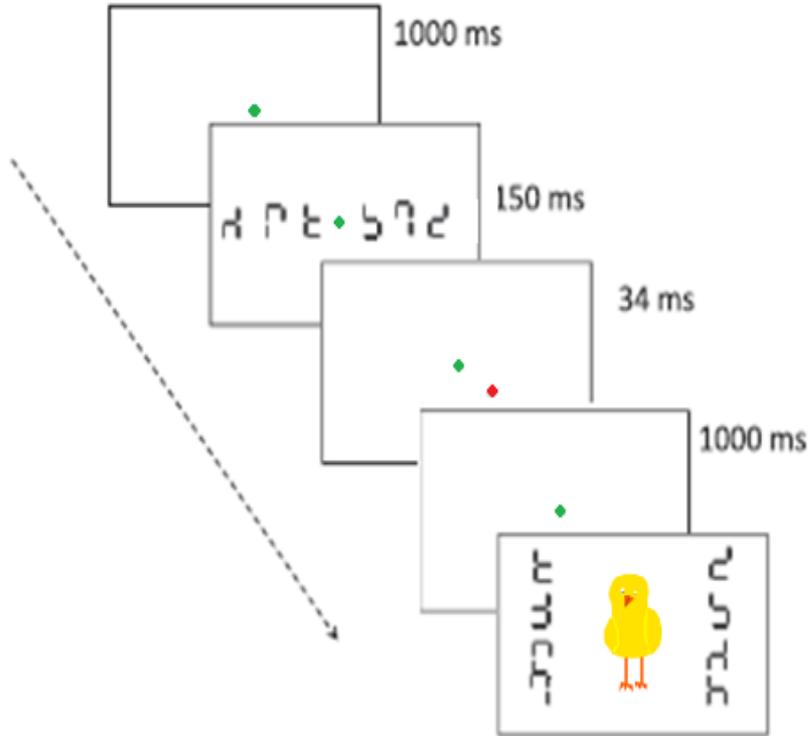
978-1-4673-1544-9/12/\$31.00 ©2012 IEEE

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 Dept. of Mathematics  
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Andrea Facoetti, Sandro Franceschini  
 Developmental and Cognitive Neuroscience Lab  
 Dept. of General Psychology  
 University of Padua



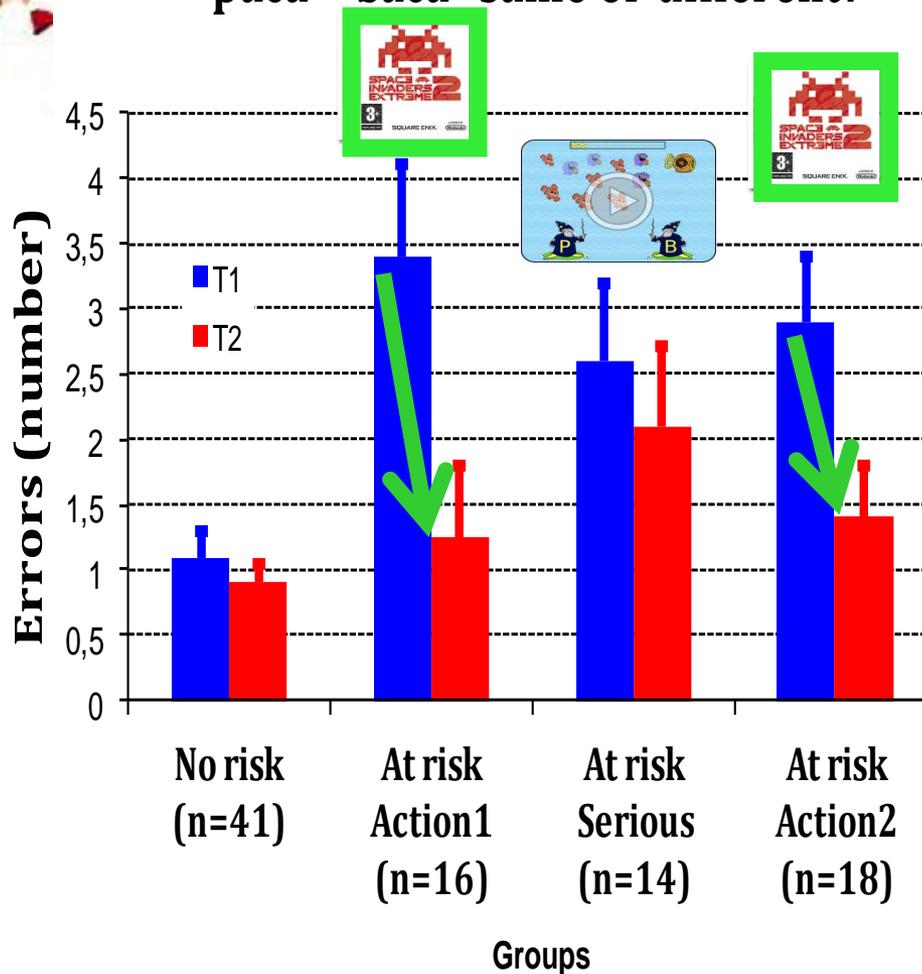
# 7. PREVENZIONE della Dislessia nei prelettori a rischio ADDESTRANDO il circuito dorsale-attenzionale (Studio 1)



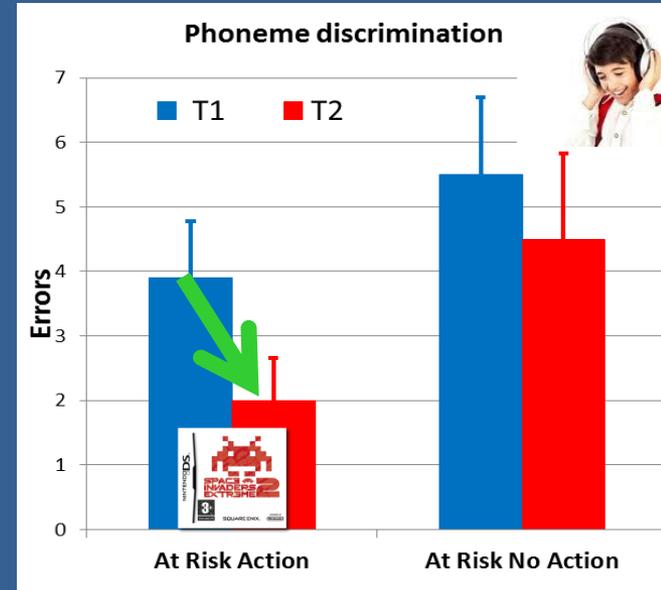
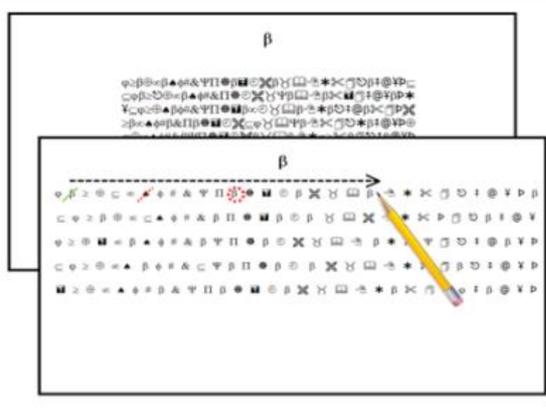
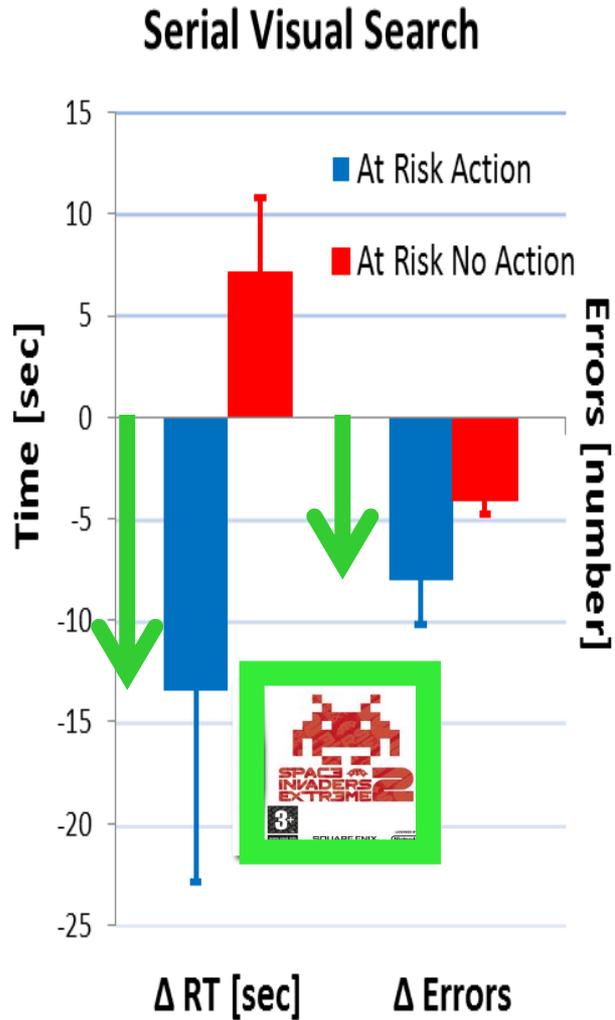
# 7. PREVENZIONE della Dislessia nei prelettori a rischio ADDESTRANDO il circuito dorsale-attenzionale (Studio 1 e 2)



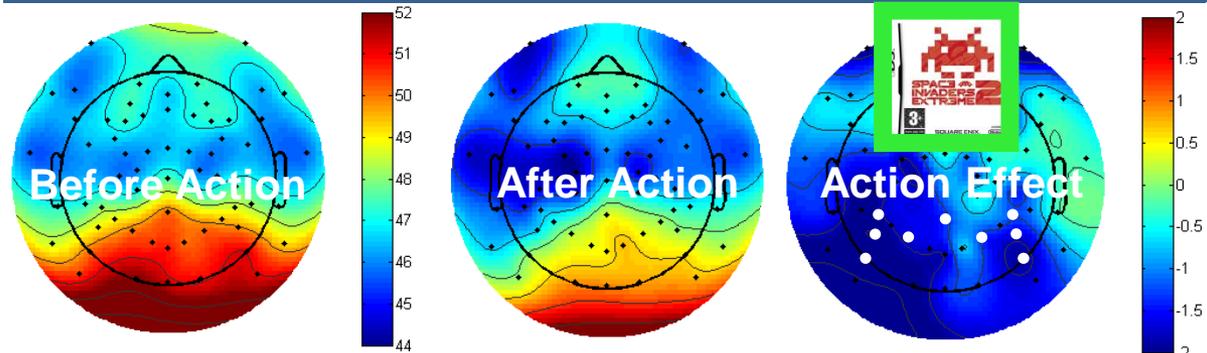
Phoneme discrimination task:  
"paca" "baca" same or different?



# 7. PREVENZIONE della Dislessia nei prelettori a rischio ADDESTRANDO il circuito dorsale-attenzionale (Studio 3)

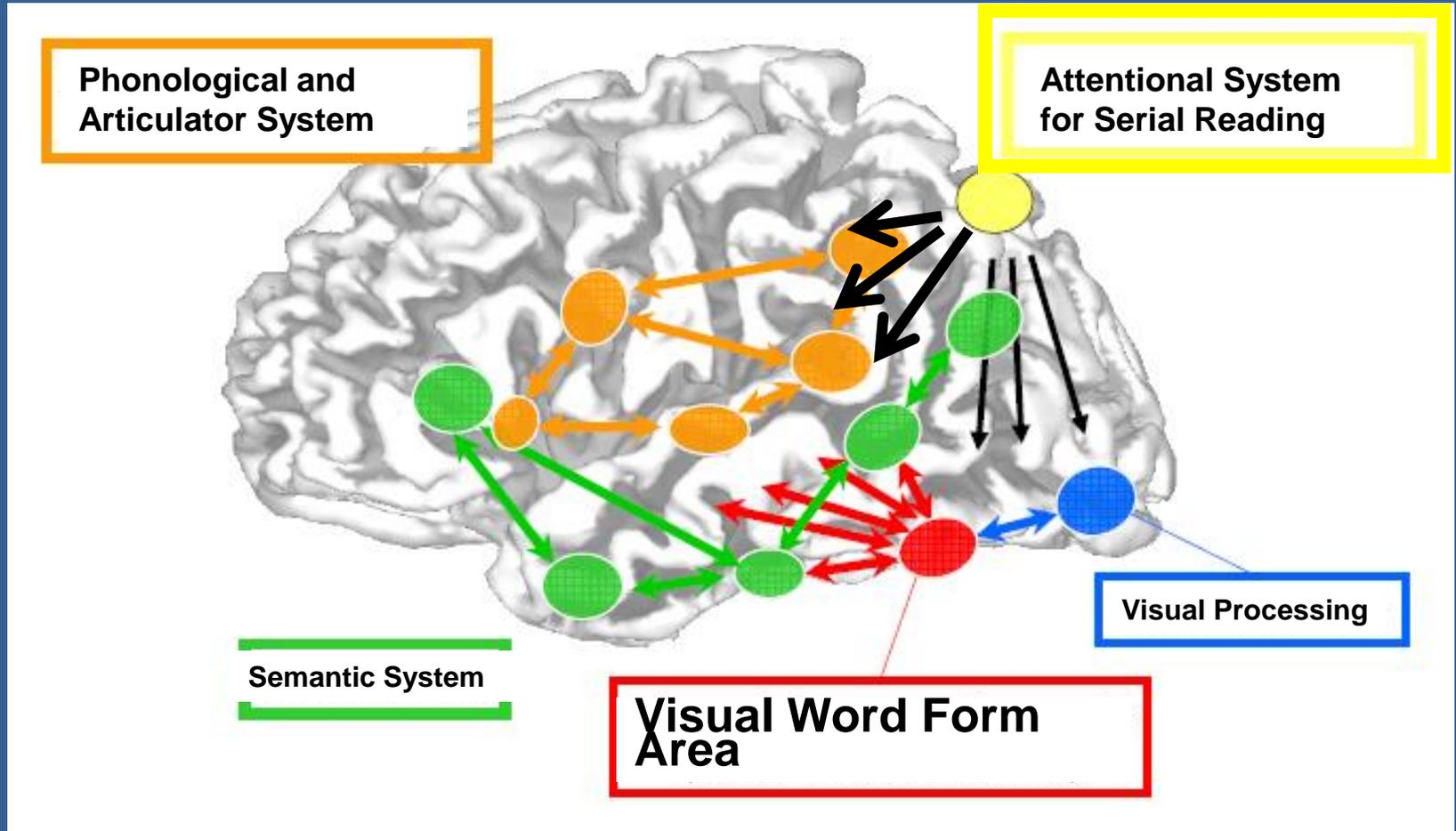


**Neural basis of AVG training in at DD risk children:  
A resting-state EEG study**  
A reduction of upper alpha band (10-14 Hz) oscillatory activity in posterior areas

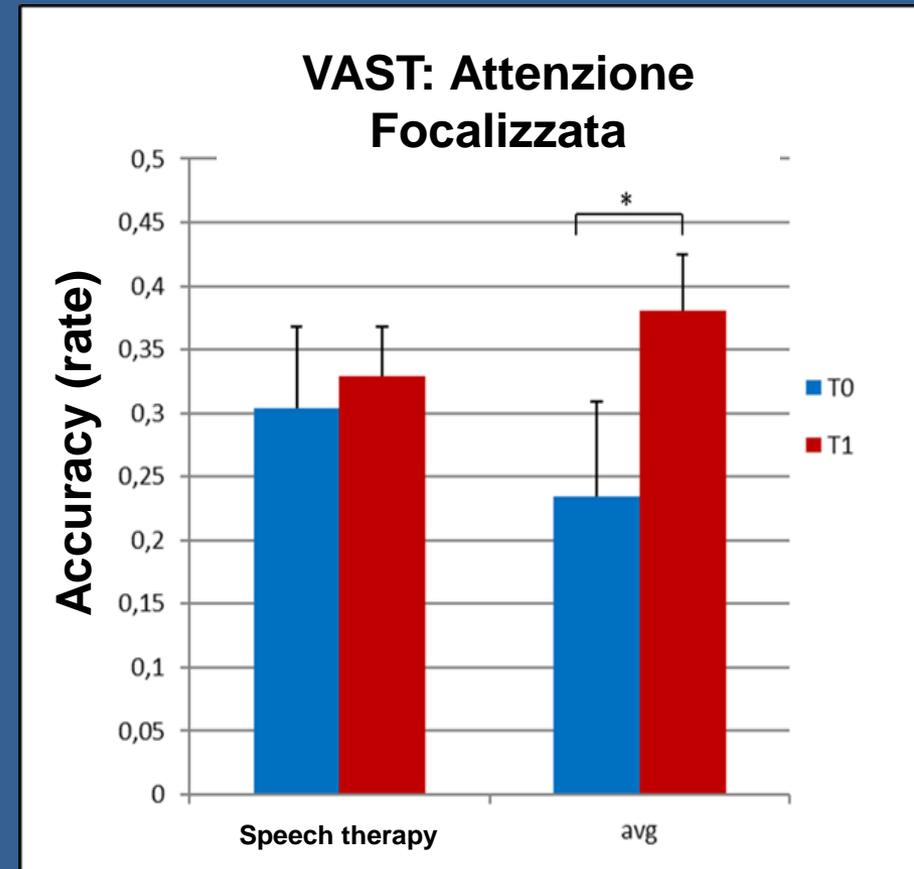
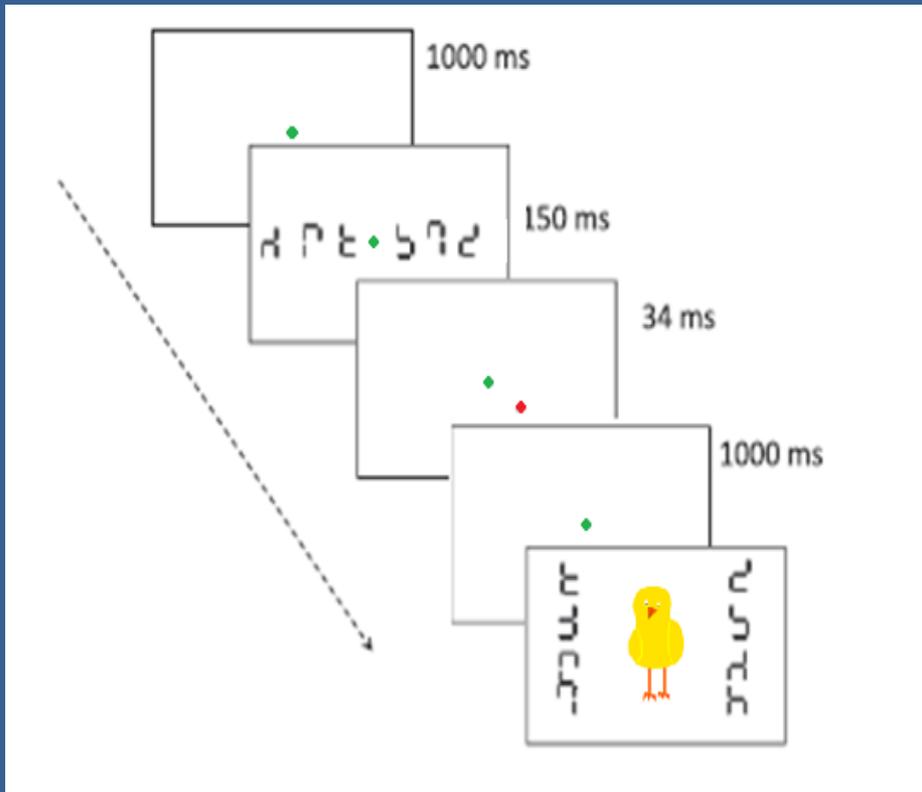


# Il Nuovo Orizzonte!

The model by Dehaene, Cohen & coll.

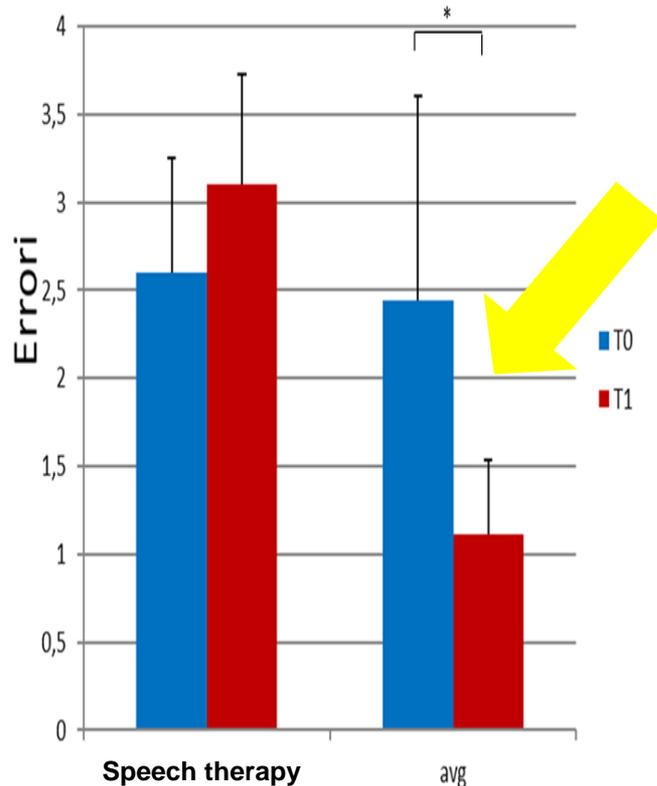


# 6. PREVENZIONE della Dislessia nei prelettori con DISTURBO SPECIFICO DEL LINGUAGGIO ADDESTRANDO il circuito dorsale-attenzionale (Studio 3)





## Discriminazione dei Fonemi



Ascoltami bene: ora ti dirò delle parole che non esistono e tu dovrai dirmi se sono uguali o no. Facciamo un esempio: se io ti dico PADE-FADE, sono uguali, sì o no? E se ti dico ZANE-ZANE? Hai capito bene? Iniziamo.

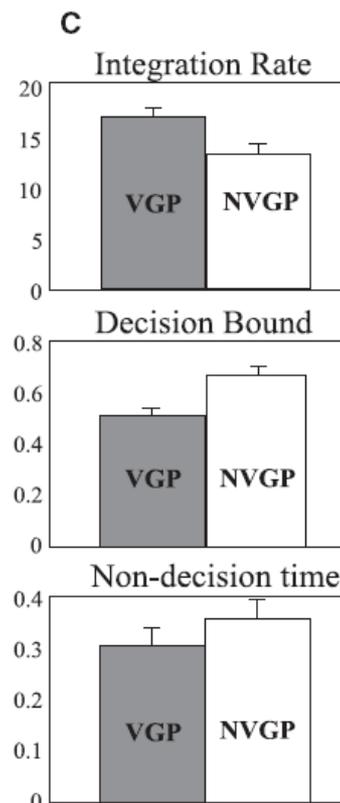
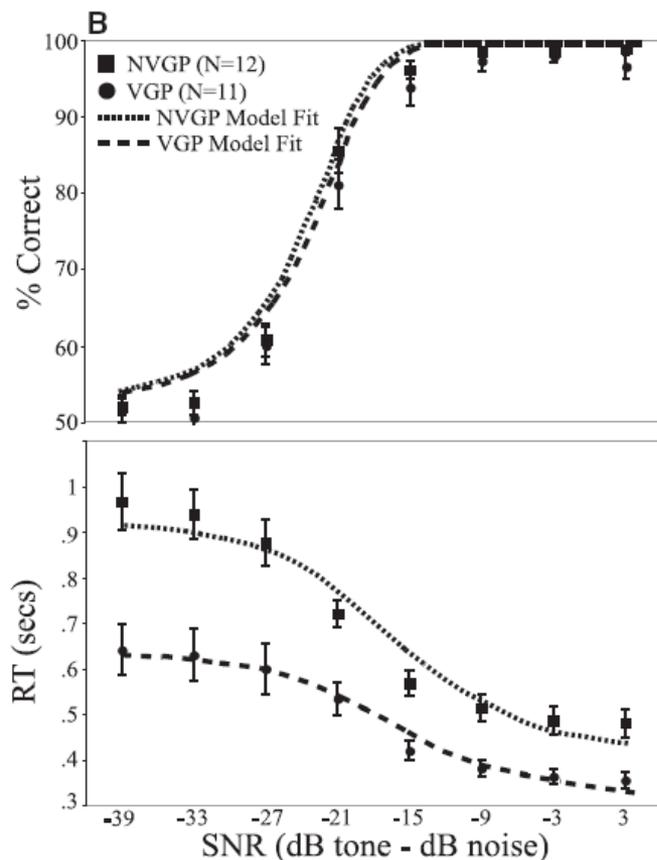
1. PACA	BACA	
2. BATA	PATA	
3. PASE	PASE	
4. FAMI	VAMI	
5. VALA	VALA	
6. LETA	LEDA	
7. TOCO	DOCO	
8. CILA	GILA	
9. GIPI	GIPI	
10. MUNO	NUNO	
11. CANO	CAMO	
12. LACO	RACO	
13. SALU	SALU	
14. SEBA	ZEBA	
15. RAVE	SAVE	

# Improved Probabilistic Inference as a General Learning Mechanism with Action Video Games

C. Shawn Green,<sup>1,2</sup> Alexandre Pouget,<sup>1</sup> and Daphne Bavelier<sup>1,\*</sup>

<sup>1</sup>Department of Brain and Cognitive Sciences, University of Rochester, Rochester, NY 14627, USA

meet our standards for improved probabilistic inference. These can be defined rigorously in the task we chose by considering decision making from a probabilistic perspective. Before committing to a choice, the best a subject can do is to



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