

# **Social Cognition and Neurocognition: Distinctiveness from Each Other and Relationships to Outcome**

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**Michael F. Green, PhD**

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- Department of Psychiatry and Biobehavioral Sciences, Geffen School of Medicine at UCLA
  - UCLA Semel Institute
- VA Desert Pacific Mental Illness, Research, Education and Clinical Center (MIRECC)

# Disclosures for Michael F. Green

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## **Consultant**

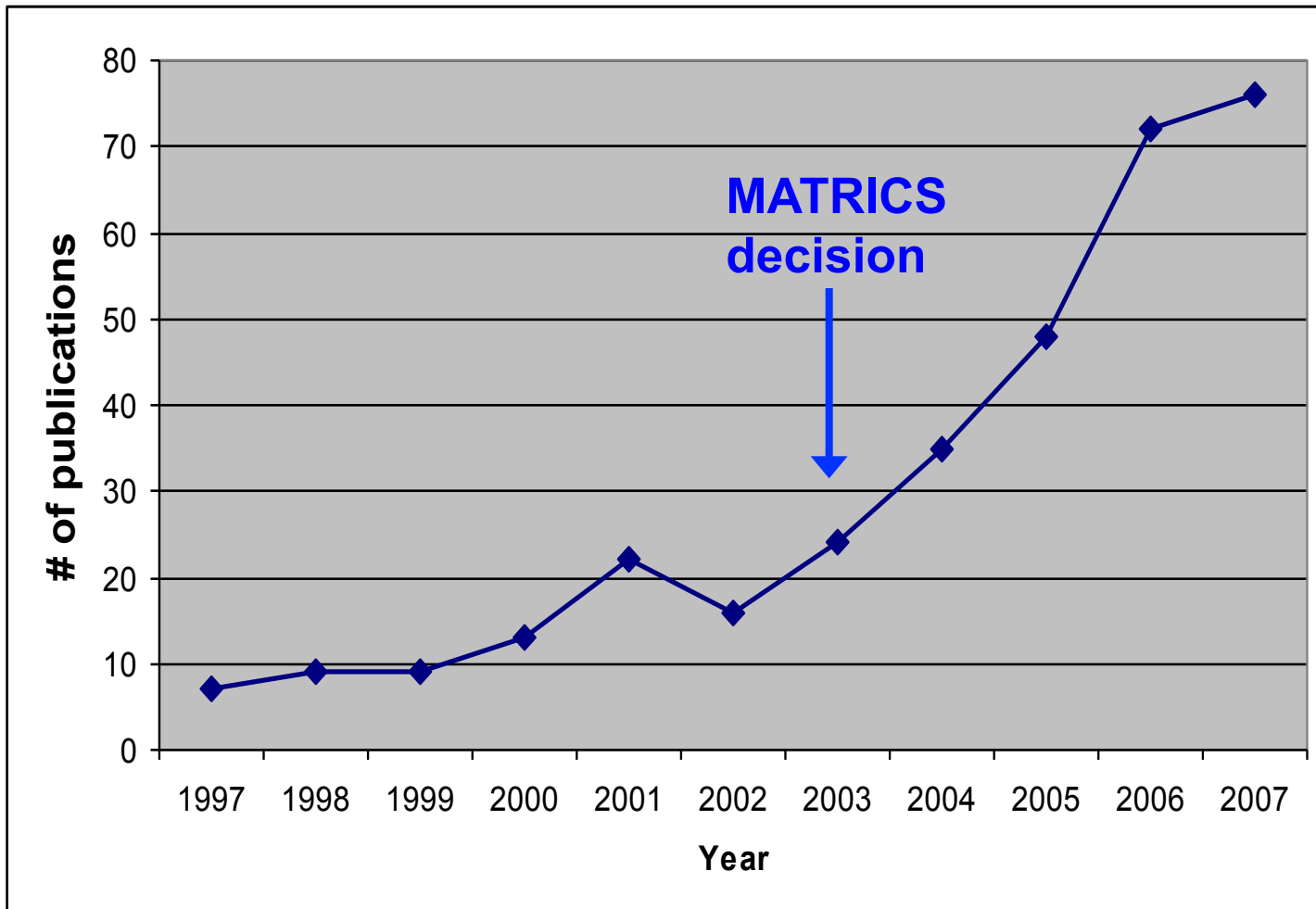
Abbott Laboratories, Amgen, Mnemosyne,  
Shire

## **Officer in non-profit**

MATRICS Assessment, Inc – but receive no  
financial compensation

# Social Cognition and Schizophrenia Publications by Year

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Pub Med  
search:  
“social  
cognition,  
schizophrenia,  
and 2011”  
yielded **302**  
**articles**

# Outline of Presentation

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- **What are the relevant domains of social cognition in schizophrenia research?**
- **Is social cognition distinct from neurocognition?**
- **How does social cognition relate to daily functioning?**
- **Could a drug have a specific effect on social cognition?**

# Social Cognition

## Lower-level and higher level processes

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We mortals cannot read other people's minds directly. But we make good guesses from what they say, what we read between the lines, what they show in their faces and eyes, and what best explains their behavior.

*It is our species' most remarkable talent.* Steven Pinker



# Social Cognition

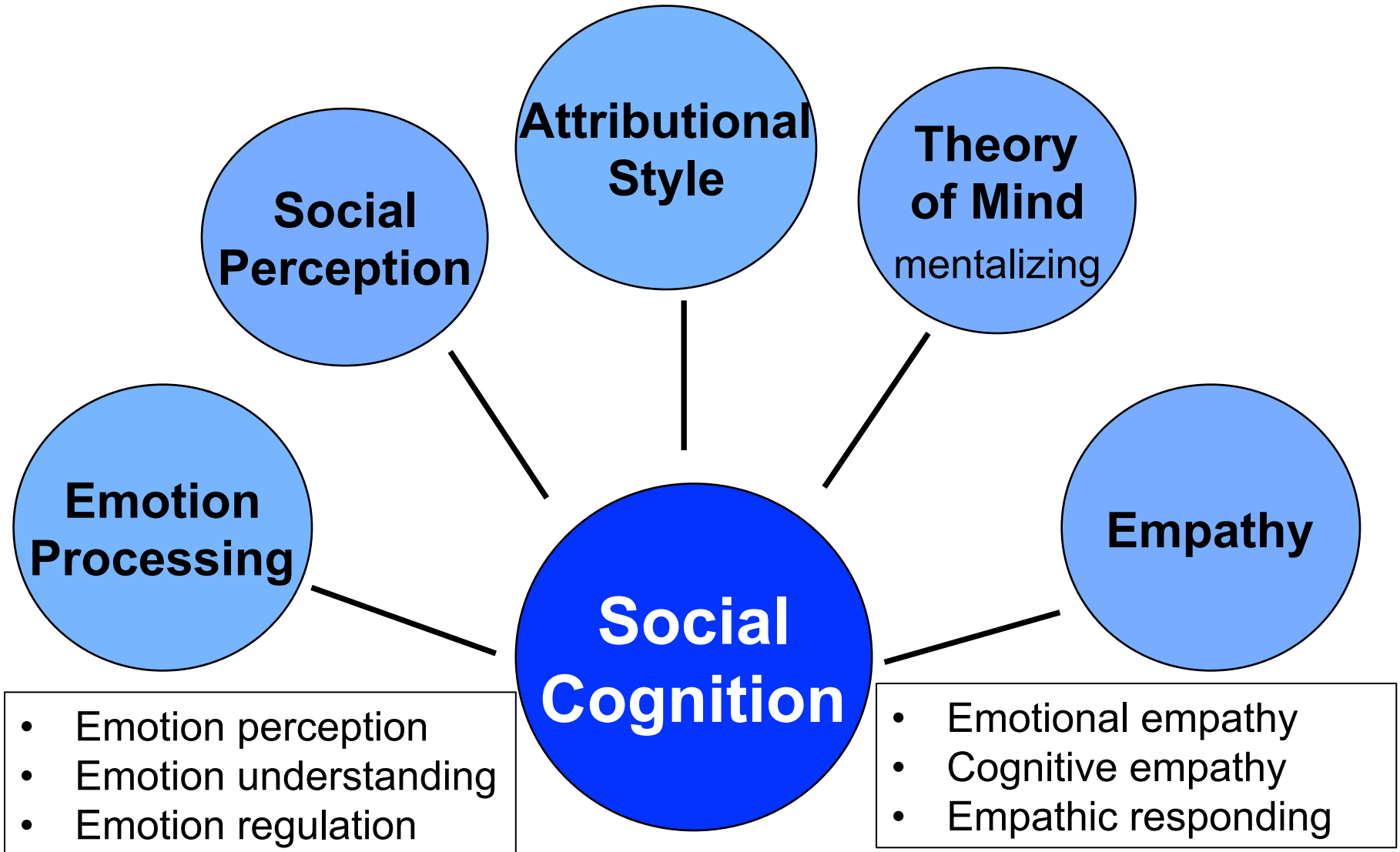
## Interplay between higher & lower level information



Patient: If I see someone talking in a friendly way and smiling, but they have their arms crossed in front of me, that confuses me. It makes me feel off- like a mixed

# Social Cognition Research in Schizophrenia - Domains

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# Do Neurocognition and Social Cognition Factor Separately in Schizophrenia?

## Studies with multiple social cognitive tasks

Study	Year	Patients	Analysis	Support?
Sergi, et al	2007, Sz Res	100 Sz and S-Aff	Structural equation modeling	<b>Yes</b>
Allen et al.	2007 Sz Res	169 Sz	Confirmatory Factor Analysis (CFA)	<b>Yes</b>
van Hooren et al.	2008 Sz Res	44 psychotic dx; 47 familial risk; 41 psychom. risk	Exploratory (EFA) groups separately and together	<b>Yes</b>
Williams et al.	2008 Sz Res	56 first episode Sz patients	Exploratory (PCA)	<b>Yes</b>
Bell et al.	2009 Sz Bull	151 Sz and S-Aff	CFA	<b>Yes</b>
Hoe et al.	2012, Psych Med	130 Sz at BL, 105 at 1 yr follow up	CFA	<b>Yes</b>

# Classification of Patients based on Presence of Impairment (at least 1 SD below controls)

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Cognitive Domains			
		Neurocognition Impairment?	
		Yes	No
Social cognition Impairment?	Yes	68%	
	No		7%

119 patients with Schizophrenia or Schiz-Aff disorder

# Classification of Patients based on Presence of Impairment (at least 1 SD below controls)

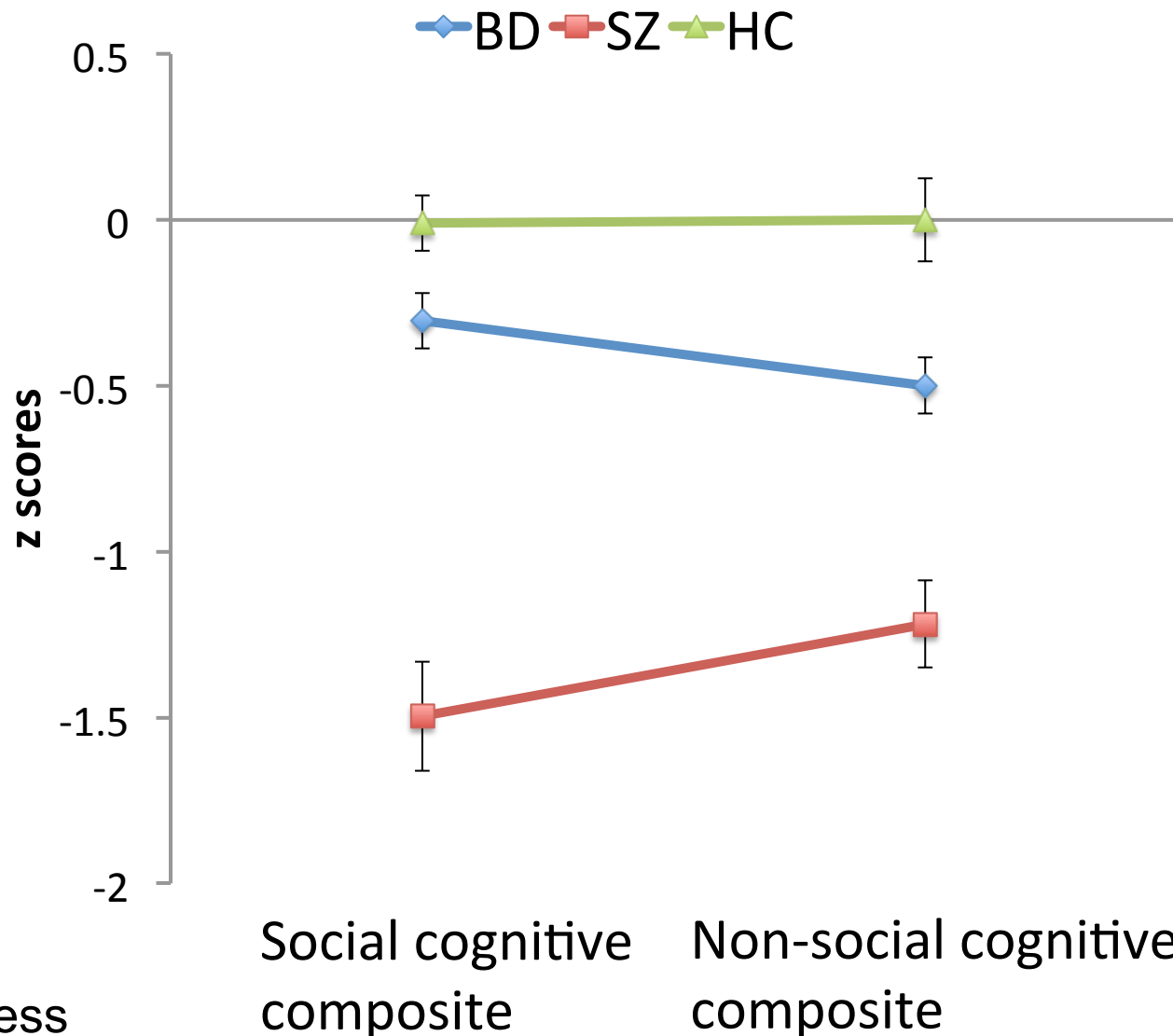
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Cognitive Domains			
		Neurocognition Impairment?	
		Yes	No
Social cognition Impairment?	Yes	68%	25%
	No	1%	7%

Chi square (1) = 12.23,  $p < .001$

119 patients with Schizophrenia or Schiz-Aff disorder

# Social Cognition versus Neurocognition in Schizophrenia and Bipolar Disorder



Lee et al.  
*AJP*, in press

# **Social cognition and community functioning in schizophrenia**

## **meta-analysis of 52 studies; 2692 subjects**

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**Estimated average correlation (and confidence interval) by social cognitive domain:**

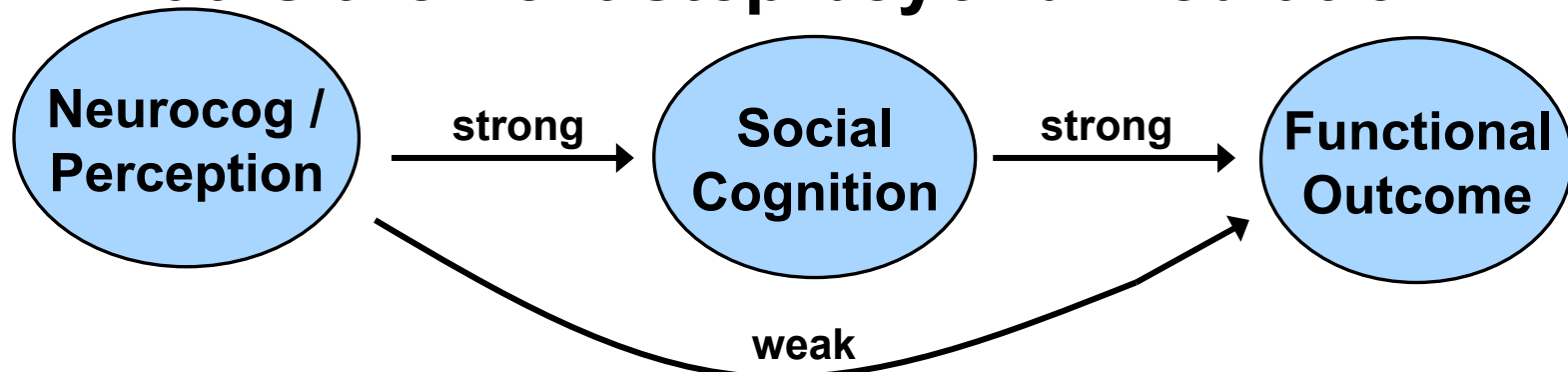
- Theory of Mind = .48 (.32 - .61)**
- Social perception = .41 (.14 - .63)**
- Emotion perception/processing = .31 (.21 - .40)**

**Social cognition explained relatively more variance in community outcome (16%) than non-social neurocognition (6%)**

# Why is social cognition related to functional outcome? -- Mediation

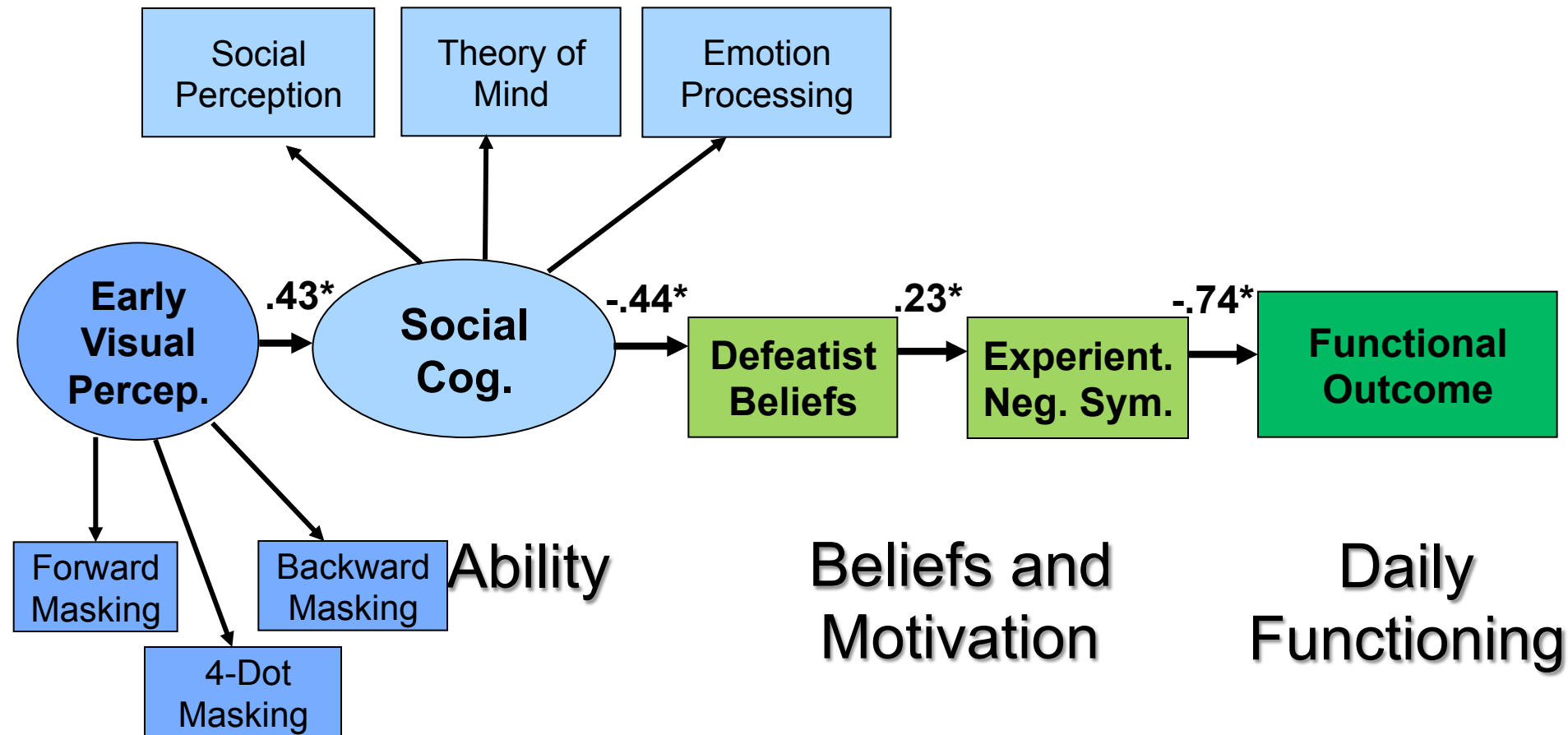
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- Review of 15 studies that examined social cognition as mediator between neurocognition or perception and outcome
- 14/15 supported mediation; authors conducted separate study and found mediation (15/16)
- Average of 25% variance in functional outcome explained in the mediation model
- What is the next step beyond mediation?



# Mapping Pathways to Functional Outcome

## Final Model



All paths marked with \* are significant  $p < .05$

Chi square = 39.41,  $p = 0.04$ ;  
 CFI = 0.96; RMSEA = 0.06  
 Indirect path (EVP  $\rightarrow$  function) is sig.

# **Psychopharmacological Approaches Specifically for Social Cognition**

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**Increasing interest in use of neuropeptides, e.g.,  
oxytocin and vasopressin**

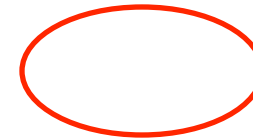
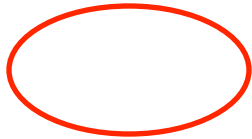
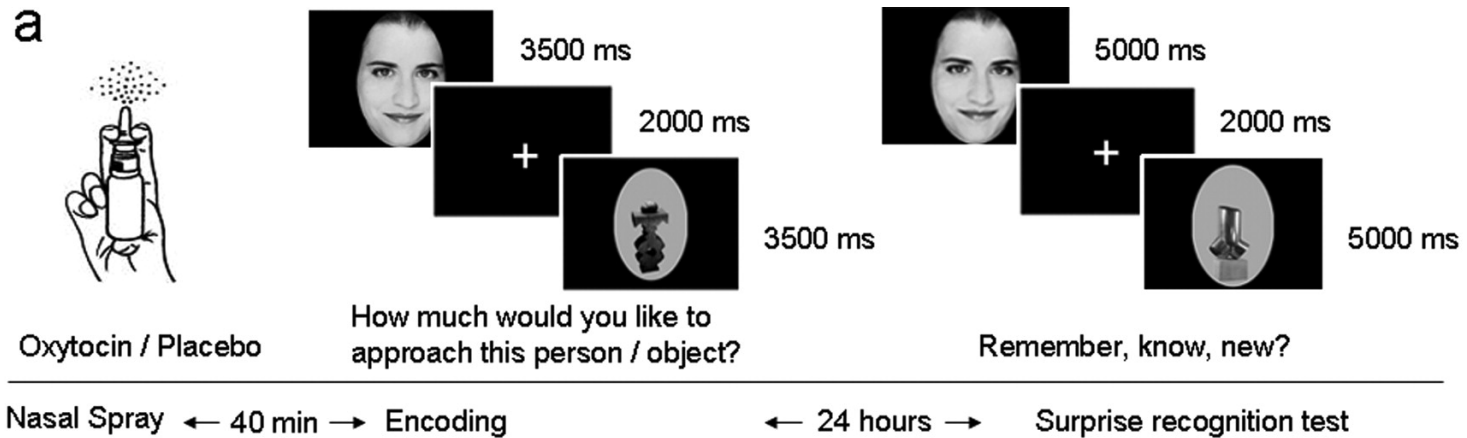
**... two reliable cognitive markers of response to  
oxytocin in humans (higher and lower-level):**

**1) It enhances early and rapid detection of affect  
from social stimuli.**

**2) It enhances appraisal of affect from socially-  
relevant information at strategic levels.**

Guastelle and MacLeod in press

# Oxytocin: Are the Effects Selective for Social Stimuli?



# Oxytocin and Social Cognition in Schizophrenia – Pilot studies

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Study	Subjects	Dosing	Results for Soc Cog
Pedersen et al. 2011	20 patients, parallel group	24 IU spray, PL, BID, 2 weeks	No between-group effects; within group improvement on 1 measure of ToM in OT group
Averbeck et al. 2011	21 male patients, cross over	24 IU spray or PL 1 hr before assessments a week apart	Significant, but small, effect of OT for emotion identification across emotion type
Goldman et al. 2011	5 patients with polydipsia, 8 without, cross over	PL, 10 or 20 IU spray about 1 week apart	Complex pattern, depended on dose, group, and emotion type

# **Combining Oxytocin with Social Cognition Training (Marder, PI)**

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- **All subjects take social cognition training for 12 sessions**
- **Prior to training, they are randomly assigned to 40 IU of oxytocin or placebo nasal spray**
- **Subjects are tested on outcome measure as usual (no spray)**
- **Study examines whether oxytocin can augment social cognitive training (not improve social cognition alone).**

# Panel Agenda

## **Michael Green**

Social cognition and neurocognition: distinctiveness from each other and relationships to outcome

## **Philip Harvey**

Evaluating outcome measures for clinical trials of social cognition in schizophrenia

## **Keith Nuechterlein**

Experience from multi-site clinical trials on neurocognition versus global cognition endpoints

## **Gerhard Hellemann**

Addressing challenges in the international assessment of social cognition

## **Ni Khin and Panel members**

Regulatory perspective and panel discussion

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