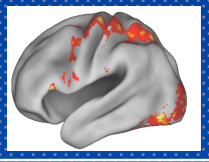
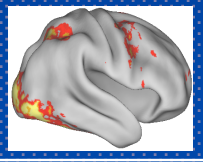


CNTRICS



Cognitive Neuroscience Treatment Research to Improve Cognition in Schizophrenia

What Criteria Should We Use?

- Tied to the strengths and advantages of cognitive neuroscience tools
- Relevant for treatment development
- Not tied to established psychometric or task properties
- Not constrained by absence of evidence (as opposed to evidence of absence)

Possible Criteria for Cognitive Mechanisms

Readily measured in humans
Strong evidence of impairment in schizophrenia
Linked to functional outcome in schizophrenia
Clarity of the understanding/specification of the cognitive system/mechanism
Clarity of the link to a specific neural circuit
Measures practically amenable for use in human imaging studies
Link to neural systems in humans through functional neuroimaging
Link to neural systems in humans through neuropsychopharmacology
Linked to the signs and/or symptoms of schizophrenia
Evidence for amenability to improvement in schizophrenia
Degree of homology between the human and animal models
Linked to neural system in animals through neuropsychopharmacology
Clarity of the link to a specific neurotransmitter system
Availability of an explicit animal model
Link to neural systems in humans through neuropsychology (e.g., lesion studies)
Formal similarity between the measures in humans and animals
Associated with schizophrenia relevant genetic polymorphisms
Linked to neural system in animals through electrophysiological studies
Linked to neural system in animals through lesion studies (reversible or not)

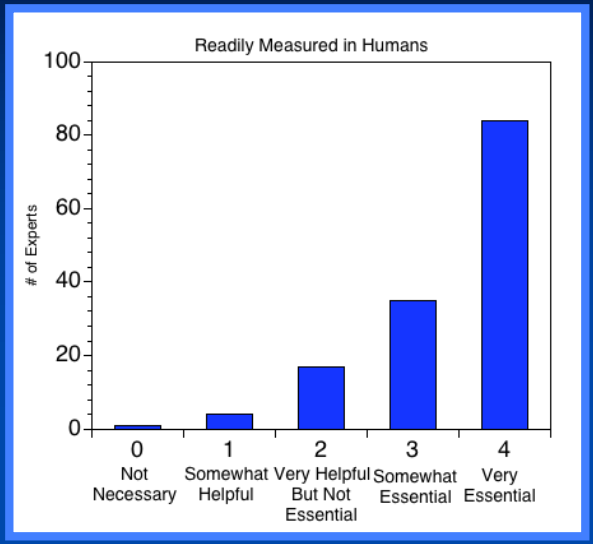
Rating Scale

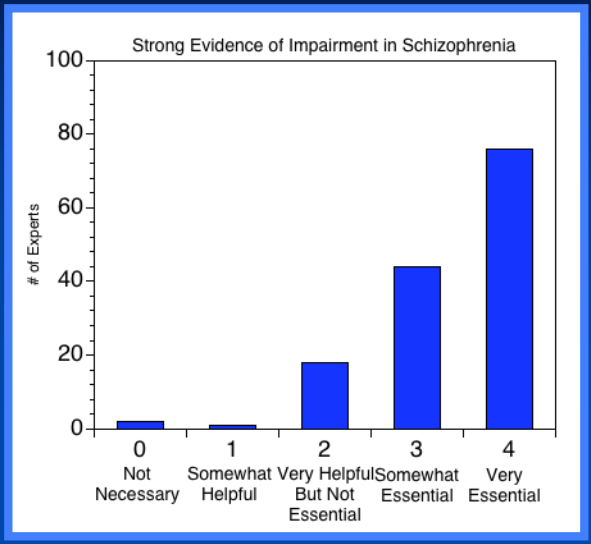
Not Necessary	Somewhat Helpful	Very Helpful But Not Essential	Somewhat Essential	Very Essential
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

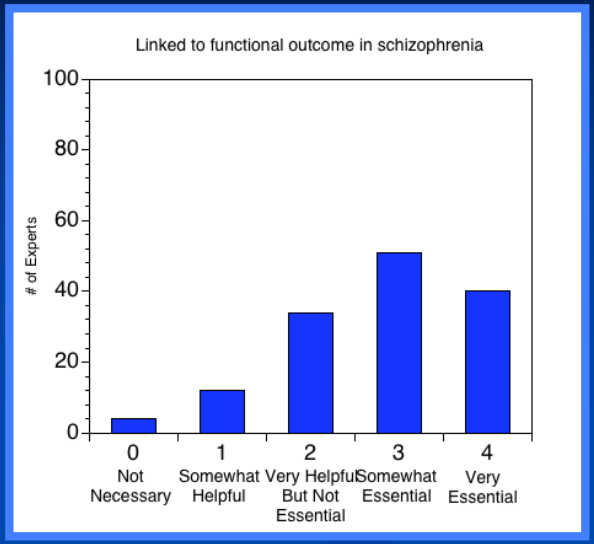
Results of Survey Criteria

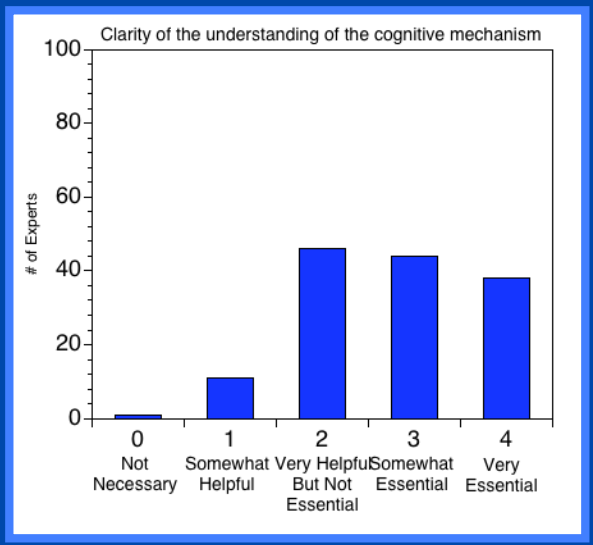
	Total (N=141)	Academics (N=125)	Industry (N=16)
Readily measured in humans	**3.40 (1)**	**3.41 (1)**	**3.31 (2)**
Strong evidence of impairment in schizophrenia	**3.35 (2)**	**3.34 (2)**	**3.50 (1)**
Linked to functional outcome in schizophrenia	**2.79 (3)**	**2.78 (4)**	**2.88 (6)**
Clarity of the understanding/specification of the cognitive system/mechanism	**2.76 (4)**	**2.80 (3)**	**2.50 (9)**
Clarity of the link to a specific neural circuit	**2.48 (5)**	**2.50 (5)**	**2.25(13)**
Measures practically amenable for use in human imaging studies	**2.41 (6)**	**2.44 (6)**	**2.19 (14)**
Link to neural systems in humans through functional neuroimaging	**2.41 (7)**	**2.35 (7)**	**2.56 (7)**
Link to neural systems in humans through neuropsychopharmacology	**2.36 (8)**	**2.35 (8)**	**2.44 (10)**
Linked to the signs and/or symptoms of schizophrenia	2.35 (9)	2.26 (9)	3.0 (4)
Evidence for amenability to improvement in schizophrenia	2.26 (10)	2.25 (10)	2.44 (11)
Degree of homology between the human and animal models	**2.14 (11)**	**2.04 (12)**	**2.94 (5)**
Linked to neural system in animals through neuropsychopharmacology	2.11 (12)	2.05 (11)	2.56 (8)
Clarity of the link to a specific neurotransmitter system	2.06 (13)	2.02 (13)	2.38 (12)
Availability of an explicit animal model	**2.06 (14)**	**1.92 (5)**	**3.13 (3)**
Link to neural systems in humans through neuropsychology	1.92 (15)	1.98 (14)	1.50 (18)
Formal similarity between the measures in humans and animals	1.79 (16)	1.78 (16)	1.94 (15)
Associated with schizophrenia relevant genetic polymorphisms	1.76 (17)	1.78 (17)	1.69 (16)
Linked to neural system in animals through electrophysiological studies	1.72 (18)	1.76 (18)	1.44 (19)
Linked to neural system in animals through lesion studies	1.71 (19)	1.73 (19)	1.56 (17)

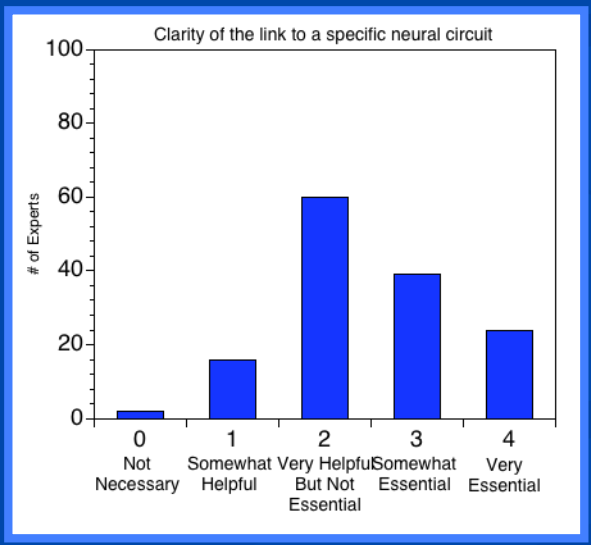
Results of Survey Criteria

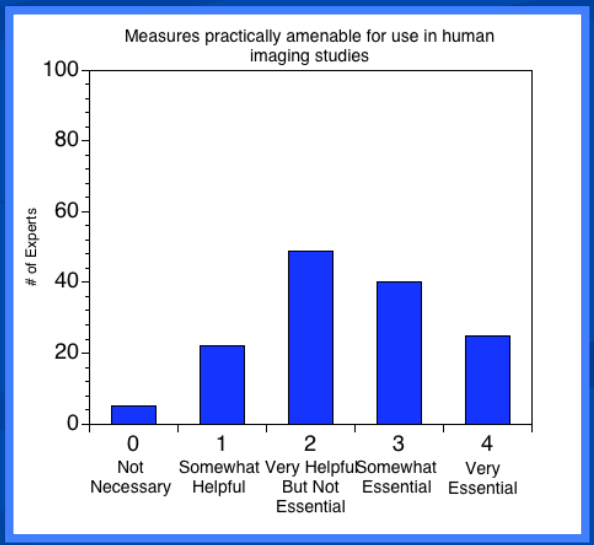












Initial Construct List

- Broad coverage
- Starting point, not an ending point
- Input from individuals with diverse backgrounds
  - Human and animal researchers
  - Clinical and basic researchers
  - Academic and Industry

What is in your folder?

- Survey results for total sample
- Survey results by field
  - Animal and human cognitive neuroscience
  - Cognitive neuroscience of schizophrenia
  - Other (sorry!)

Perception
Steve Dakin, Dan Javitt

- Visual motion processing
- Visual form processing
- Visual feature binding
- Gestalt processing
- Auditory perception

Working Memory
Ed Smith, Sohee Park

- Storage
- Updating
- Manipulation
- Control processing

Long-term Learning and Memory Anthony Wagner, Paul Fletcher, Charan Ranganath

- Encoding (including item and relational)
- Retrieval (item specific and relational)
- Source memory
- Strategy generation and application
- Recollection
- Familiarity
- Semantic memory/representations
- Semantic priming
- Reinforcement based learning

Attention
Steve Luck, Jim Gold

- Attention shifting
- Selection under distraction
- Preparatory attention

Executive Control
Todd Braver, Keith Nuechterlein

- Set-shifting
- Sequencing
- Conflict monitoring
- Conflict resolution
- Meta-cognition
- Planning

Social Cognitive Processing (broadly defined) Kevin Ochsner, Michael Green

- Facial affect recognition
- Emotion regulation
- Effects of emotion on decision making and memory
- Theory of mind

Post Discussion Ratings

- We will ask you to rate again at the end of the breakout session
  - Adding in or deleting constructs

Breakout Sessions

- Morning (11:30 am to 1:00 pm)
  - Perception: Brookside B
  - Working Memory: Glen Echo
  - Social/Emotion: Linden Oak
- Afternoon (4:30 pm to 6:00 pm)
  - Long Term Memory: Brookside B
  - Executive Control: Glen Echo
  - Attention: Linden Oak