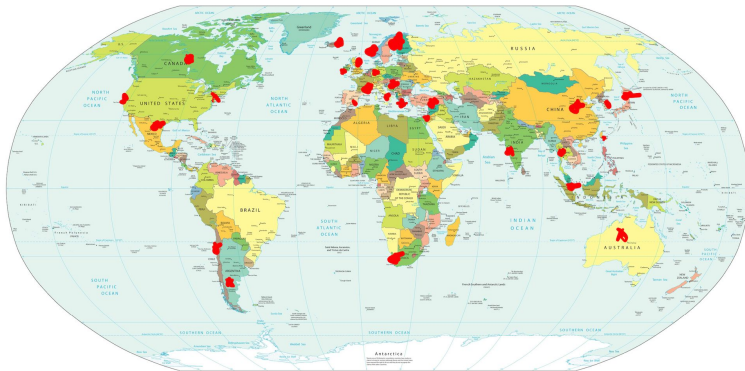


# Social Cognitive Deficits in Schizophrenia: Does Culture Matter?



**Social Cognition:**  
“The mental operations that underlie social interactions, including perceiving, interpreting, and generating responses to the intentions, dispositions, and behaviors of others.”

## Introduction

Schizophrenia occurs in around 1% of the population worldwide and is diagnosed in all cultures and socioeconomic groups. Individuals with schizophrenia experience varying levels of social cognitive deficits in domains such as theory of mind, empathy, affect recognition, attributional style and social perception. These deficits may serve as barriers to normal social interactions and affect functional outcome due to the increased difficulty perceiving/responding to the actions of others and correctly identifying social contexts. This could result in difficulties maintaining employment, functioning in the community and communicating with others. Evidence comparing cross-cultural differences using psychometrically strong social cognitive measures, most of which were developed in the US and UK, is lacking. There has been limited consideration of how culture and social norms affect the function and accuracy of these measures to assess social cognitive deficits, and whether social cognitive ability differs around the world. The following meta-analysis aims to fill in some of these gaps by investigating the cross-cultural validity of social cognitive measures created in Western countries. Relevant studies, published in or after 1980, and collected from the PsychINFO, PubMed, CINAHL, and ProQuest Dissertations and Theses databases were coded and then analyzed using Comprehensive Meta-Analysis software. We chose to focus specifically on eight measures identified by experts in the Social Cognition Psychometric Evaluation (SCOPE) trial as the best existing measures of social cognition (Pinkham et al, 2014). Insight into how culture influences the measurement and expression of social cognition could help lead to the development of more culturally-sensitive approaches to the assessment, treatment, and understanding of schizophrenia. More accurate measures of social cognitive deficits will ultimately allow for more effective treatment intervention for people with schizophrenia all around the world.

## Methodology

### Initial Steps/ Screening:

- Parallel searches were conducted in PubMed/MEDLINE, PsychINFO, CINAHL, and ProQuest: Dissertation and Thesis Global.
- Covidence systematic review software (Veritas Health Innovation Ltd, 2020) was used to help aid in screening and data extraction.
- Title and abstracts of remaining citations were screened by two reviewers independently against the inclusion/exclusion criteria. Irrelevant papers were excluded.

### Inclusion/Exclusion criteria:

- 70% of patient sample diagnosed with schizophrenia or schizoaffective diagnosis, included non-psychiatric healthy control group, reported on unique data, had at least one measure of social cognition as determined by the NIMH-funded SCOPE trial (Pinkham et al, 2014).

### Data Extraction and Coding:

- After key sources and texts were identified, the following data (and more) was extracted into a database:
  - Author(s), SCOPE measure(s), sample size & demographics, country, region of study (north america, europe, south america, asia, other mixed), income of country, results of SCOPE measure (SD and Mean)

### Data Analysis:

- 150 papers extracted in total
- Data was coded and reviewed independently by 3 reviewers to ensure accuracy (96.3% Inter-rater reliability)
- Statistical analyses were conducted using Comprehensive Meta-Analysis Software

## Hypotheses

- Schizophrenic individuals across all cultures will perform significantly more poorly on social cognitive measures in 3 relevant domains: ToM/mental state attribution, social perception, and emotion processing/regulation domains, as compared to healthy controls.
- There will be a smaller difference in performance between patients and controls in non-Western regions and non-high-income countries than those in Western regions and higher income countries

## Prisma Diagram

The PRISMA flow diagram below depicts the flow of information through the different phases of our systematic review.

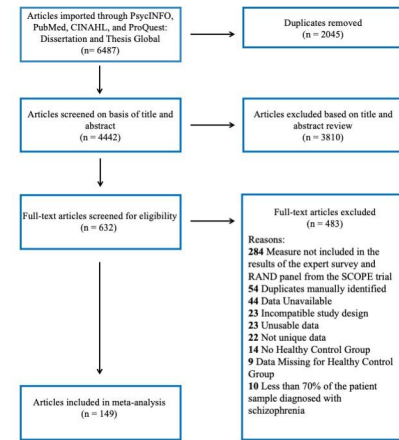


Figure 1. Prisma Flow Diagram

## Effect Sizes

Outcome	Studies	Effect Size				Heterogeneity				
		Hedge's g	95% CI	z-Value	P-Value	Q-value	df (Q)	P-value	I <sup>2</sup>	N <sub>II</sub>
Emotion Processing	26	-0.758	[-0.886, -0.630]	-11.62	0.00	69.14	25	0.000	63.84	
North America	17	-0.703	[-0.854, -0.552]	-9.115	0.00	48.131	16	0.000	66.757	
Europe	5	-0.885	[-1.295, -0.475]	-4.229	0.00	8.463	4	0.076	52.738	
South America	0									
Asia	3	-0.947	[-1.150, -0.745]	-9.166	0.00	1.067	2	0.587	0.00	
North America	8	-0.88	[-1.031, -0.729]	-11.42	0.00	9.72	7	0.205	28.00	
Europe	6	-0.865	[-1.075, -0.656]	-8.089	0.00	9.43	5	0.093	46.978	
South America	0					0.00	0	1.000	0.000	
Asia	1	-0.867	[-1.180, -0.555]	-5.436	0.00	0.00	0	1.000	0.000	
Theory of Mind	125	-1.086	[-1.181, -0.991]	-22.40	0.00	834.64	124	0.000	85.14	
North America	39	-0.843	[-0.935, -0.751]	-17.959	0.00	74.311	38	0.000	48.864	
Europe	52	-1.123	[-1.244, -1.001]	-18.089	0.00	259.402	51	0.000	78.697	
South America	4	-0.745	[-1.076, -0.415]	-4.427	0.00	1.584	3	0.540	0.000	
Asia	13	-1.396	[-2.006, -0.786]	-4.483	0.00	289.104	12	0.000	95.849	
Attributional Style	33	-0.425	[-0.571, -0.278]	-5.67	0.00	170.71	32	0.000	81.255	
North America	11	-0.408	[-0.583, -0.234]	-4.583	0.00	30.895	10	0.001	67.632	
Europe	13	-0.597	[-0.937, -0.256]	-3.437	0.001	115.304	12	0.000	89.593	
South America	0									
Asia	9	-0.184	[-0.309, -0.060]	-2.902	0.004	4.055	8	0.852	0.000	
Emotion Regulation	40	-0.867	[-0.967, -0.767]	-16.997	0.00	124.767	39	0.000	68.742	
North America	21	-0.975	[-1.109, -0.841]	-14.243	0.00	44.537	20	0.001	55.094	
Europe	7	-0.970	[-1.118, -0.822]	-12.860	0.00	9.915	6	0.128	39.484	
South America	1	-1.538	[-2.363, -0.714]	-3.658	0.00	0.000	0	1.000	0.000	
Asia	7	-0.604	[-0.827, -0.381]	-5.302	0.00	17.533	6	0.008	65.778	

Figure 2: Effect Sizes Calculated by Comprehensive Meta-Analysis

## Results & Discussion

Patient and control samples were well matched for age, but educational levels and mean IQ levels were lower in patient samples. Our initial analysis shows a moderate to large effect on every domain of social cognition (emotion processing/ regulation, social perception, theory of mind and attributional style) with social perception being the most impaired and attributional style the least in individuals with schizophrenia as compared to healthy controls. These findings are consistent across all regions (North America, Europe, South America, and Asia) with the exception of attributional style in Asia which did not have a significant effect size. These results support our first hypothesis that despite cultural differences, schizophrenic individuals perform significantly worse on all social cognitive measures across five domains. The lack of significant differences between effect sizes of various countries suggests that the eight social cognitive measures validated in the SCOPE trial remain robust in the face of differences in culture.

## Conclusions

This meta-analysis was the first cross-cultural investigation of social cognitive deficits in schizophrenic individuals using only social cognitive measures whose psychometric stability and validity has been confirmed by experts in the Social Cognition Psychometric Evaluation (SCOPE) trial (Pinkham et al, 2014). Although additional analyses on moderator effects like income, region of country, age, and duration of illness have not yet been conducted, the initial stages of our research have shown that despite potential cultural differences, schizophrenic individuals consistently show significant deficits in social cognitive abilities.