Relationship between Social Cognition and Depressive Symptomatology, Anxiety and Social Functioning in Individuals with Multiple Sclerosis

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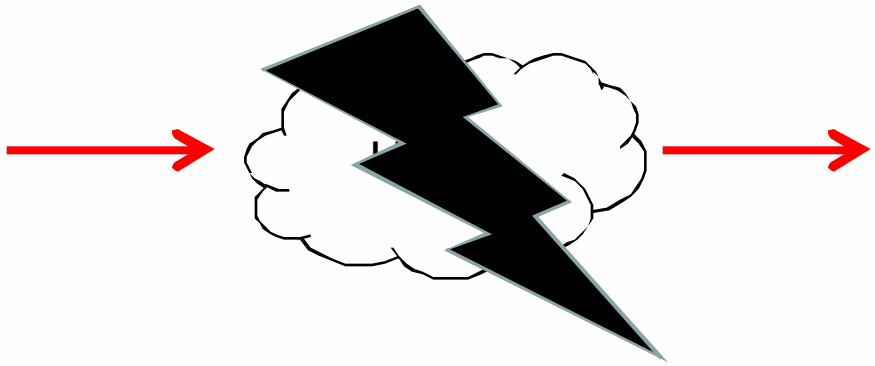
Outline

- What is social cognition and how it is assessed?
- Social cognition deficits in MS
- Examining the relationship between social cognition and depressive symptoms, anxiety and social functioning
- Future Directions

What is Social Cognition?

Abilities related to how we process social and emotional information

Stimulus → Processing → Social Behavior



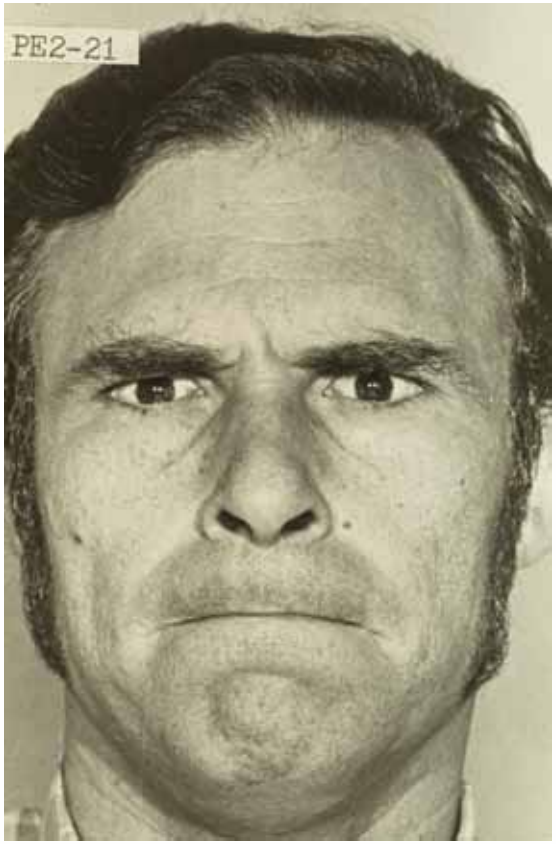
Smile Back

Types of Social Cognition

- Emotional Processing
  - Facial Affect Recognition*
  - Emotional Prosody Recognition
- Theory of Mind*
- Empathy

Facial Affect Recognition

Assessment of Facial Affect Recognition



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Theory of Mind

- The ability to understand the thoughts, beliefs, inferences of others, even when they may differ from one's own
- "Putting yourself in someone else's shoes"

Theory of Mind

- Assessments
  - Verbal tasks
    - Strange Stories (Happe, 1994)
    - Faux Pas (Stone et al., 2002)

Verbal Tasks of ToM

- Strange Stories (Happe, 1994)

Helen …knew at Christmas she could ask her parents for a rabbit. Helen wanted a rabbit more than anything... Christmas Day arrived, and Helen ran to unwrap the box her parents had given her. She felt sure it would contain a little rabbit... But when she opened it, with all the family standing round, she found her present was just a boring old set of encyclopedias, which Helen did not want at all! Still, when Helen's parents asked her how she liked her Christmas present, she said, "It's lovely, thank you. It's just what I wanted."

Why did Helen say this?

Theory of Mind

- Assessments
  - Verbal tasks
    - Strange Stories (Happe, 1994)
    - Faux Pas (Stone et al., 2002)
  - Visual Tests
    - Reading the Mind in the Eyes Task (Baron-Cohen, 2001)

terrified
arrogant

upset
annoyed

annoyed
horrified

hostile
preoccupied

Theory of Mind

- Assessments
  - Verbal tasks
    - Strange Stories (Happe, 1994)
    - Faux Pas (Stone et al., 2002)
  - Visual Tests
    - Reading the Mind in the Eyes Task (Baron-Cohen, 2001)
  - Other tests
    - Video based tests
    - Comic strips

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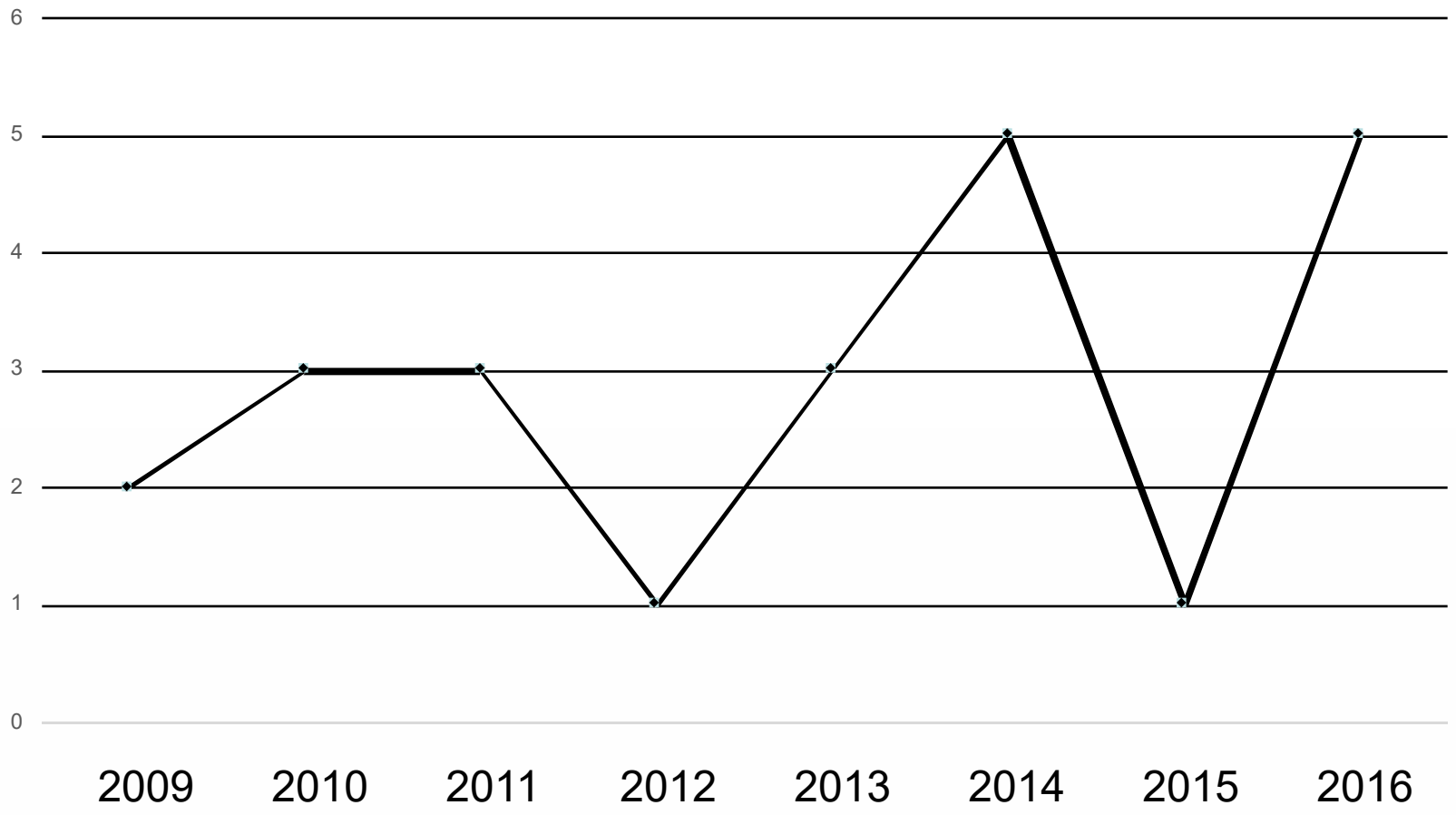
Social Cognition Articles in MS



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Social cognition in multiple sclerosis

A systematic review and meta-analysis

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ABSTRACT

Objective: To quantify the magnitude of deficits in theory of mind (ToM) and facial emotion recognition among patients with multiple sclerosis (MS) relative to healthy controls.

Methods: An electronic database search of Ovid MEDLINE, PsycINFO, and Embase was conducted from inception to April 1, 2016. Eligible studies were original research articles published in peer-reviewed journals that examined ToM or facial emotion recognition among patients with a diagnosis of MS and a healthy control comparison group. Data were independently extracted by 2 authors. Effect sizes were calculated using Hedges g.

Results: Twenty-one eligible studies were identified assessing ToM (12 studies) and/or facial emotion recognition (13 studies) among 722 patients with MS and 635 controls. Deficits in both ToM ($g = -0.71$, 95% confidence interval [CI] −0.88 to −0.55, $p < 0.001$) and facial emotion recognition ($g = -0.64$, 95% CI −0.81 to −0.47, $p < 0.001$) were identified among patients with MS relative to healthy controls. The largest deficits were observed for visual ToM tasks and for the recognition of negative facial emotional expressions. Older age predicted larger emotion recognition deficits. Other cognitive domains were inconsistently associated with social cognitive performance.

Conclusions: Social cognitive deficits are an overlooked but potentially important aspect of cognitive impairment in MS with potential prognostic significance for social functioning and quality of life. Further research is required to clarify the longitudinal course of social cognitive dysfunction, its association with MS disease characteristics and neurocognitive impairment, and the MS-specific neurologic damage underlying these deficits. ***Neurology*® 2016;87:1727–1736**

Social Cognition Deficits in MS

Table 2 Mean weighted effect sizes, sample sizes, and heterogeneity statistics

Test	No. of studies	No. (MS)	No. (controls)	Hedges g	95% CI	Z	p
FER (overall)	13	473	423	−0.64	−0.81 to −0.47	−7.23	<0.001
Anger	8	344	301	−0.58	−0.81 to −0.36	−5.03	<0.001
Disgust	7	289	280	−0.24	−0.51 to 0.03	−1.72	0.086
Fear	8	344	301	−0.56	−0.81 to −0.32	−4.49	<0.001
Happiness	8	344	301	−0.14	−0.35 to 0.07	−1.31	0.190
Sadness	8	344	301	−0.35	−0.54 to −0.17	−3.72	<0.001
Surprise	7	289	280	−0.25	−0.50 to 0.01	−1.91	0.056

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Cotter et al., Neurology (2016)

Importance in MS

Social Cognition Deficits may lead to:

- Shrinking social network
- Reduced employment
- Difficulties with family and social interpersonal communication
- Reduction in quality of life
- Depression and anxiety
- Reduced social functioning

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HOWEVER, VERY FEW STUDIES HAVE EXAMINED THIS TOPIC

Outline

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Current Study

- Examining the relationship between social cognition:
  - Depressive symptoms
  - Anxiety
  - Social functioning

Methods

- Participants: 28 individuals with MS
- Experiment:
  - Subjects completed a battery of tests and questionnaires
    - Social Cognition (Facial Emotion Identification Tast; Reading Mind in the Eyes, Strange Stories)
    - Depression (Beck Depression Inventory-II)
    - Anxiety (State-Trait Anxiety Scale)
    - Social Functioning (Modified Fatigue Impact Scale-Psychosocial Fatigue subscale)

Demographics

	Range	Mean (SD)
Age	35-65	52.4(9.1)
Education (yrs)	12-19	15.5(1.6)
Gender	22 Female / 6 Male	n/a
Years since diagnosis	6-36	17.6(9.2)
Subtype	RR: 19 PP: 3 SP: 4 PR: 2	n/a

Analysis

- Pearson correlation coefficients were calculated to examine the associations between:
  - Social cognitive measures (each emotion of the FEIT, Reading the Mind in the Eyes total score, and Strange Stories total score)
  - Total score on the BDI, State and Trait scores, and MFIS-psychosocial subscores.

Results

	Beck Depression	State	Trait	MFIS-psychosocial
Facial Affect Recognition				
happy	**-.576			
anger	*-.362		*-.353	**-.503
fear	*-.391	**-.544		
sad	*-.411		**-.471	*-.350
disgust		*-.339		
surprise		*.387	*.400	

*p<.05, **p<.01

Results

	Beck Depression	State	Trait	MFIS-psychosocial
Reading Mind in the Eyes		*-.361	**-.463	*-.332
Strange Stories		*-.330	*-.346	*-.339

*p<.05, **p<.01

Results

	Beck Depression	State	Trait	MFIS-psychosocial
Facial Affect Recognition				
happy	**			
anger	*		*	**
fear	*	**		
sad	*		**	*
disgust		*		
surprise		*	*	
Reading Mind in the Eyes		*	**	*
Strange Stories		*	*	*

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*p<.05, **p<.01

Discussion

- Overall, lower performance on social cognitive measures was associated with increased depressive symptomatology, anxiety and psychosocial fatigue

Depression

- Depression was associated with worse facial affect recognition (happy, angry, fear, sad), but not ToM measures
- This is consistent with studies on depression which show that depressed individuals have worse facial affect recognition
- Further, individuals with MS who are depressed perform worse on cognitive tasks (although social cognition not examined)
- More research needed to determine why ToM not correlated with depression

Anxiety

- State anxiety was associated with:
  - Ability to identify fear, disgust and surprise*
  - Both ToM tasks
- Trait anxiety was associated with:
  - Ability to identify anger, sad and surprise*
  - Both ToM tasks
- Anxiety also has been show to affect performance on social cognition tests in general public.
- Recently, the effects of anxiety on cognition were examined in individuals with MS
  - Anxious individuals performed worse on PASAT and BVMT

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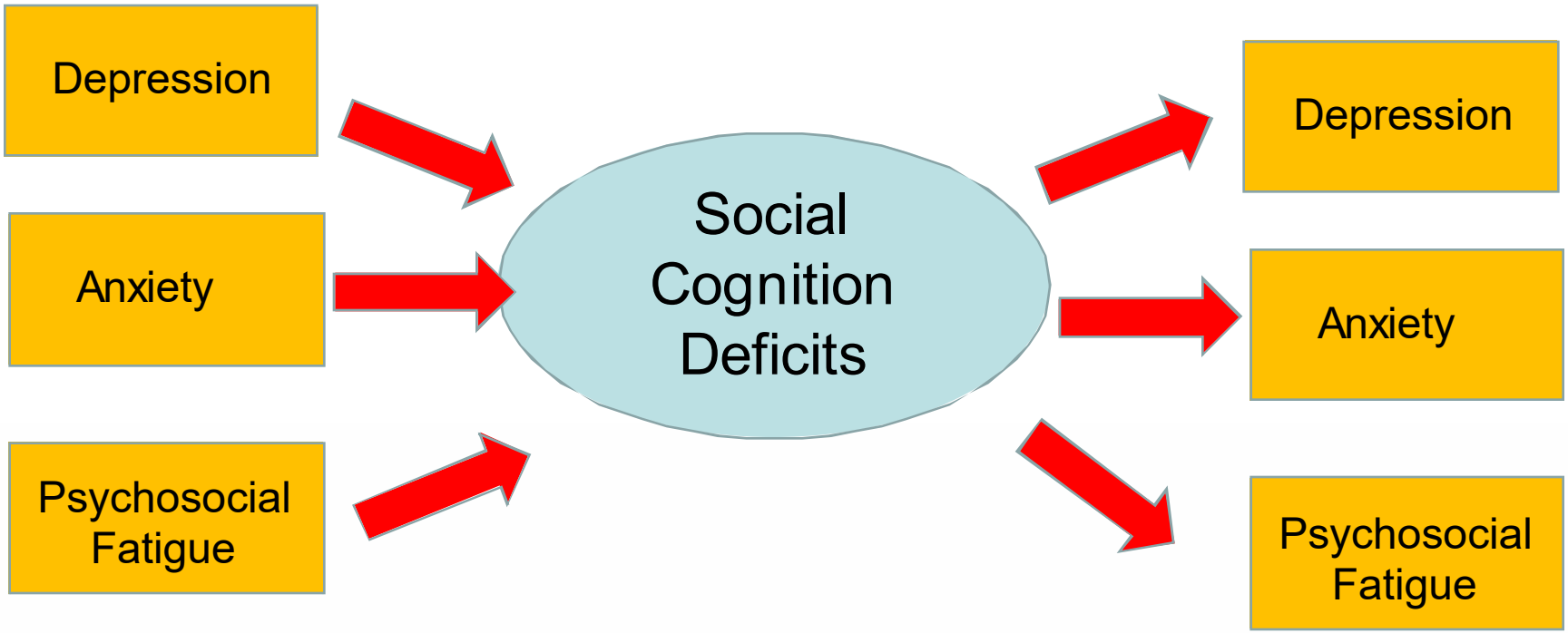
**Better recognition of surprise was associated with increased anxiety*

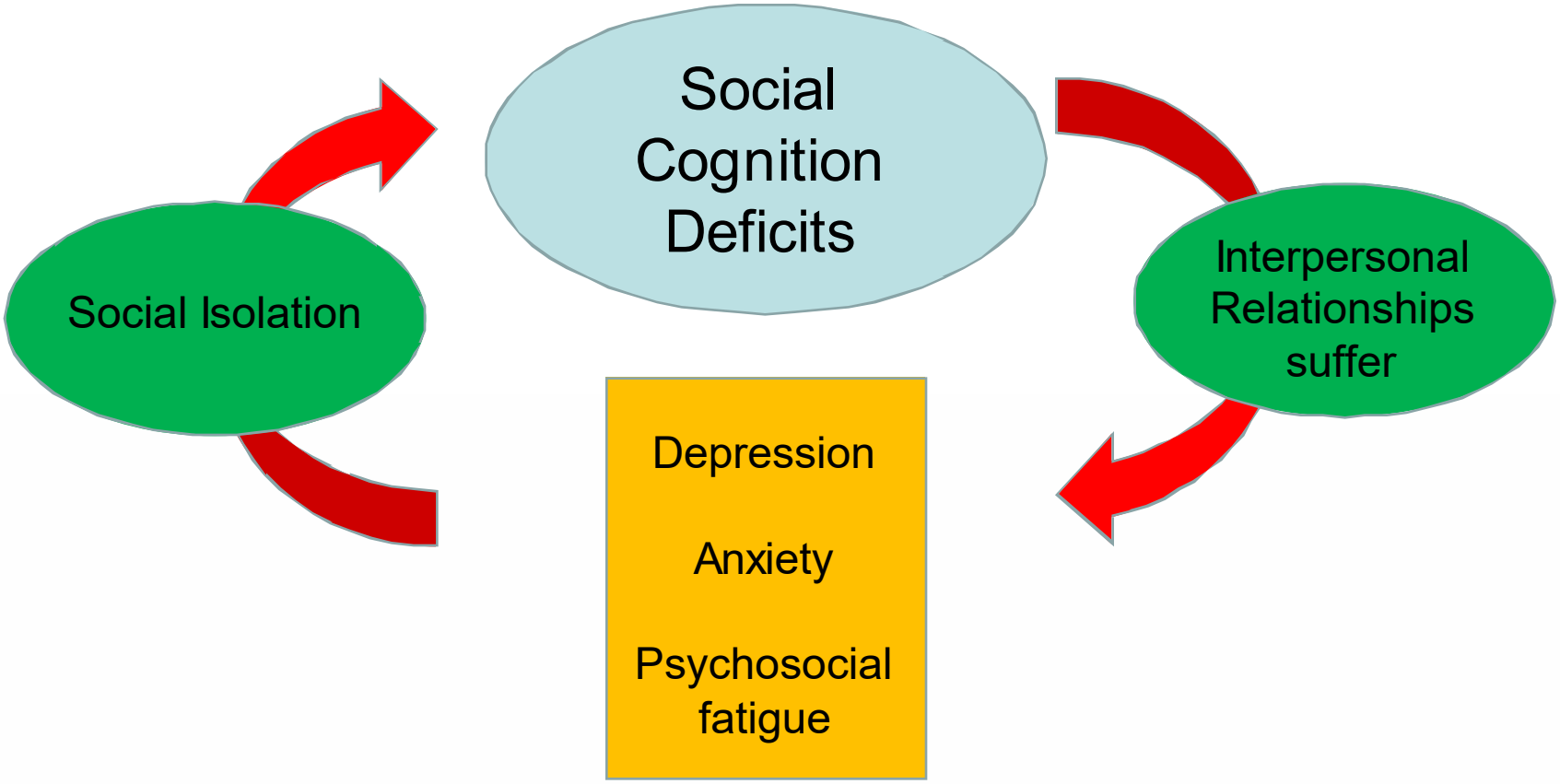
Social Functioning

- MFIS-psychosocial fatigue is also related to social cognition
  - Anger, sad/ Both ToM measures
- A limitation is that psychosocial fatigue is difficult to interpret. Is it representative of social functioning?
- Recently, it was reported that more psychosocial fatigue was associated with less work hours (Van der Hiele, 2014)
- Although psychosocial fatigue is less well understood compared to depression and anxiety, may represent an important variable of social functioning.

Potential Model



Potential Model



Future Directions

- Regression analysis to determine causality
- Examine in Progressive MS
- Examine the effects of an emotional processing intervention on these outcome variables

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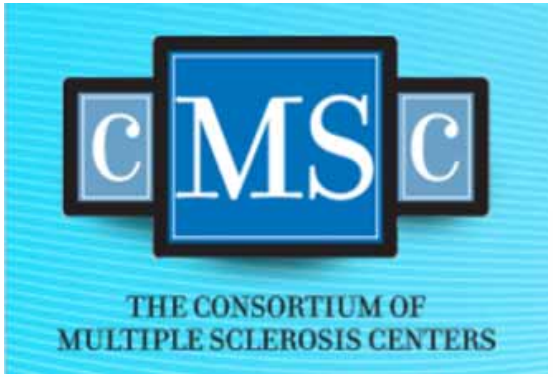

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