

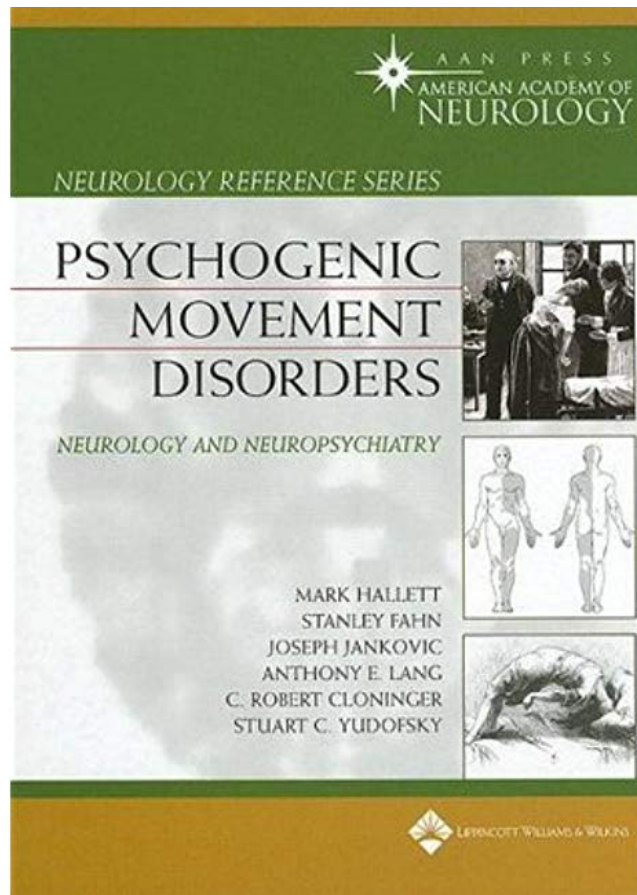
# Functional symptoms in movement disorders

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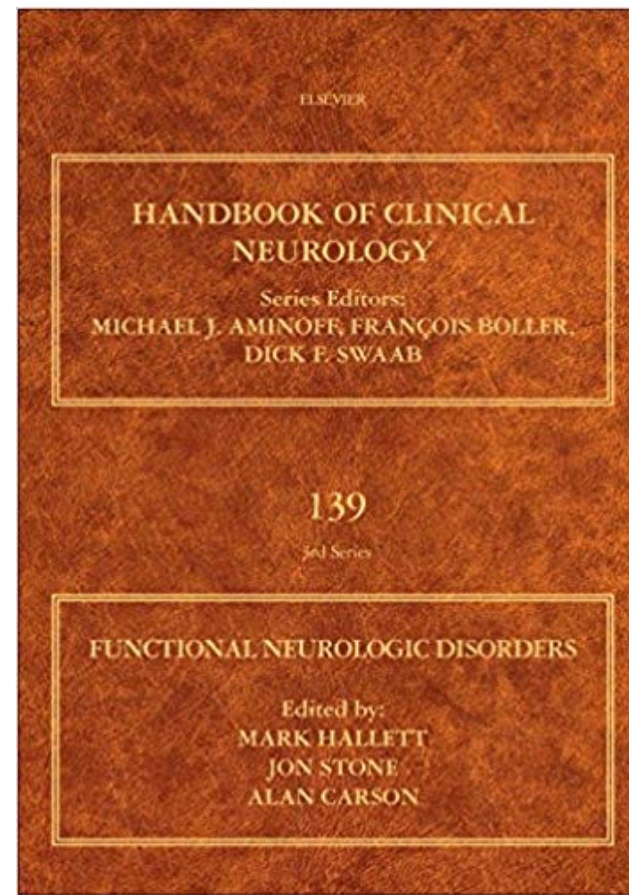
Translational Neurosciences – Born Bunge Institute

Faculty of Medicine and Health Sciences



“In his neurological unit at the Hôpital de la Salpêtrière, the neurologist Jean-Martin Charcot studied many patients who today would likely be considered to have psychogenic movement disorders. Collectively diagnosed primarily under the designation hysteria, these patients had a variety of focal neurologic signs...”

Hallett et al. eds, 2006



“On his neurological unit at the Salpêtrière Hospital in Paris, the neurologist Jean-Martin Charcot studied many patients who today would likely be considered to have functional movement disorders. Collectively diagnosed primarily under the designation hysteria, these patients had a variety of neurologic signs...”

Hallett et al. eds, 2016

# Psychogenic parkinsonism

- 12/14 pts presented with tremor
- Absence of silent period between rest and posture ('re-emergence')
- Rigidity featured voluntary resistance
- Slowness lacking decrement
- Spontaneous remissions and placebo effect
- In 1 patient: "possibility that prominent psychogenic features may be superimposed on organic parkinsonism in some patients"



# Psychogenic parkinsonism

- concordance between independent clinical, electrophysiological, and [ $^{123}\text{I}$ ]-FP-CIT SPECT scan explorations in 9 suspected psychogenic PD patients
- 3 patients 'pure' psychogenic parkinsonism (PP)  
6 with "a form of combined psychogenic parkinsonism and Parkinson's disease (PP + PD)"
- characteristics of psychogenic tremor in 5 of 7 patients with tremor
- 1 patient with PD showing a negative DATscan (SWEDD) over time finally re-considered as PP
- *Illustrates diagnostic difficulty and terminological issues*

“Patients who are diagnosed with a neurological disease may have additional symptoms that are considered to be unexplained by that disease and, instead, are best characterised as functional (psychogenic) symptoms.”

Stone J, Carson A, Duncan R, et al. Which neurological diseases are most likely to be associated with “symptoms unexplained by organic disease.” J Neurol 2012;259:33–38.

**Table 1** Frequency of physical and psychological symptoms in patients with a neurological disease diagnosis according to how much their symptoms were rated as “explained by disease”

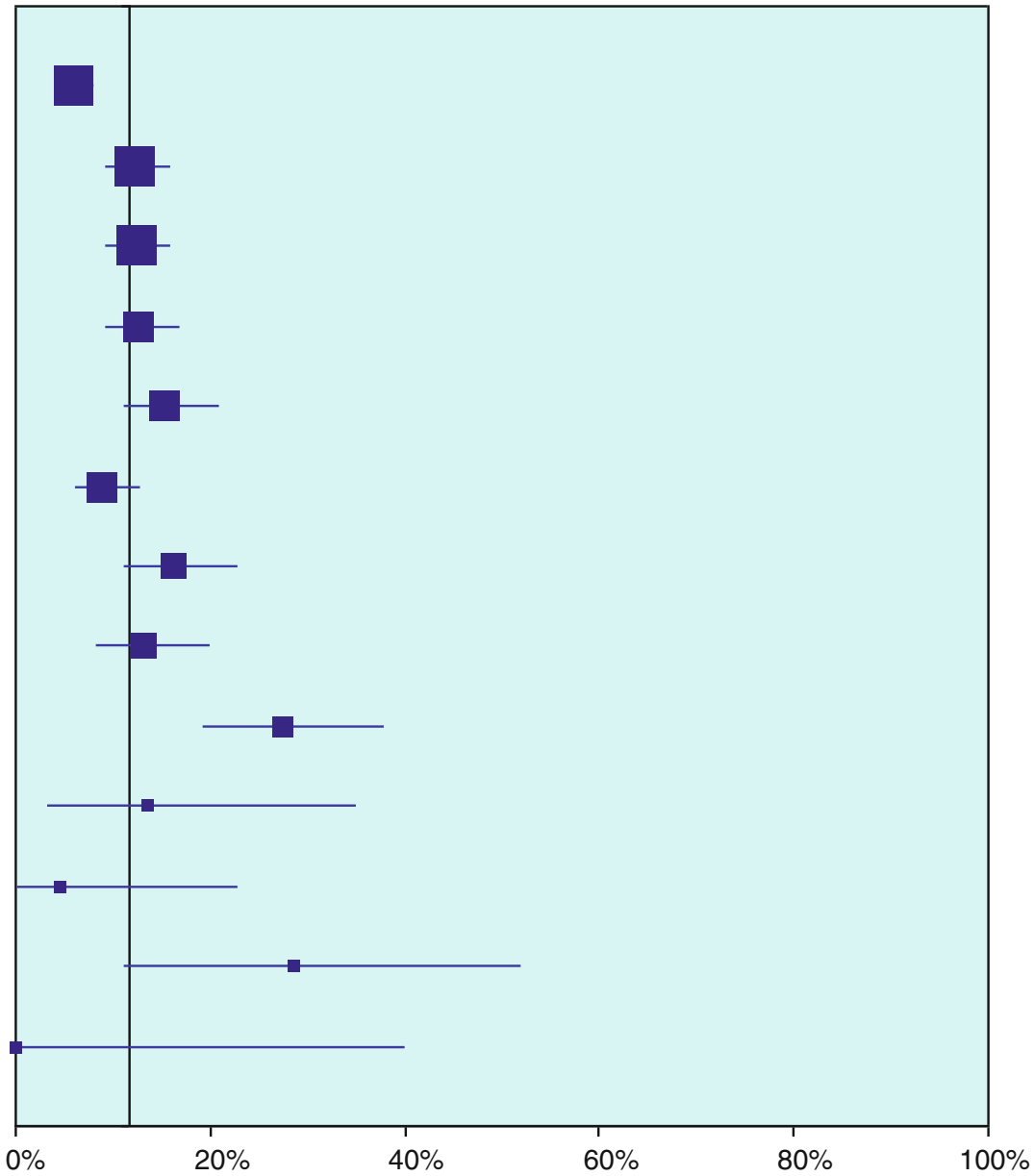
	Neurological disease diagnosis but rated as having symptoms “not at all explained” or “somewhat explained” by disease	Neurological disease diagnosis but rated as having symptoms “completely explained” or “largely explained” by disease	Significance ( <i>t</i> test)	95% confidence interval for difference between means
Number of patients	293	2174	–	–
Age (years, mean)	46.9	48.7	NS ( <i>p</i> = 0.08)	–
Emotional symptoms—HADS (mean)				
Anxiety (HADS score)	7.9	6.4	<i>p</i> < 0.0001	0.99–2.12
Depression (HADS score)	5.8	4.8	<i>p</i> < 0.0005	0.50–1.56
Physical symptom count from PHQ (mean) <b>PHQ-15</b>				
Neurological symptoms	4.0	3.4	<i>p</i> < 0.0005	0.23–0.92
Pain symptoms	2.0	1.5	<i>p</i> < 0.0001	0.29–0.62
Gastrointestinal symptoms	1.0	0.7	<i>p</i> < 0.0001	0.12–0.38
Chest symptoms	0.9	0.6	<i>p</i> < 0.0001	0.16–0.41

Neurological symptoms: paralysis or weakness, double or blurred vision, difficulty swallowing, difficulty speaking, lack of co-ordination, dizziness, fainting spells, memory or concentration, loss of sensation, loss of vision, loss of hearing, seizure or fit; Pain symptoms: stomach pain, back pain, pain in arms, legs joints, headaches, chest pain; Chest symptoms: heart pounding or racing, shortness of breath; Gastrointestinal symptoms: constipation, nausea or gas. Headache, chest pain and stomach pain were counted in two categories

Stone J, Carson A, Duncan R, et al. Which neurological diseases are most likely to be associated with “symptoms unexplained by organic disease.” J Neurol 2012;259:33–38.

n 'unexplained by disease' /  
n in disease category

Epilepsy	31/516
Peripheral Nerve	48/398
"Other" neurological	49/395
MS / Inflammatory	32/252
Spinal Disorders	36/234
Movement Disorders	20/2224
Syncope	25/155
Stroke / TIA	17/130
General Medical	25/91
Muscle /Neuromuscular	3/22
Dementia	1/22
Brain Tumour	6/21
Motor Neurone Disease	0/7



% of patients with symptoms rated as 'not at all' or 'somewhat explained' by disease (95% CI)

Stone J, Carson A, Duncan R, et al. Which neurological diseases are most likely to be associated with "symptoms unexplained by organic disease." J Neurol 2012;259:33-38.

# The PHQ-15: Validity of a New Measure for Evaluating the Severity of Somatic Symptoms

KURT KROENKE, MD, ROBERT L. SPITZER, MD, AND JANET B. W. WILLIAMS, DSW

Psychosomatic Medicine 64:258–266 (2002)

TABLE 6. Comparison of PHQ-15 With Other Somatization Screening Measures<sup>a</sup>

Characteristic	PHQ-15	WHO SSD	SCL-12	Swartz et al.	Othmer and DeSouza
No. of symptoms	15	12	12	11	7
Time frame of symptoms	1 mo	6 mo	1 wk	Lifetime	Lifetime
Symptoms included <sup>b</sup>					
Joint or limb pain	X	X	"X"	X	X
Dizziness	X	X	½	X	
Fatigue	X	X	X		
Headaches	X	X	X		
Back pain	X	X	X		
Abdominal pain	X	X		X	
Chest pain	X		X	X	
Breathing trouble	X		X		X
Fainting	X		½	X	
Gas or indigestion	½	X		X	
Sleeping trouble	X	X			
Palpitations	X	X			
Menstrual problems	X				X
Diarrhea (constipation)	X			X	
Sexual pain/problems	X				X
Vomiting				X	X
Numbness or tingling		X	X		
Weakness			X	X	
Lump in throat			X		X
Nausea	½			X	
Heavy- or light-headedness		X			
Dry mouth		X			
Heaviness of arms/legs			X		
Hot or cold spells			X		
Feeling sickly					X
Amnesia					X

<sup>a</sup> WHO-SSD = World Health Organization Schedule for Somatoform Disorders screener; SCL-12 Hopkins Symptom Checklist somatization scale; Swartz et al. (24) and Othmer and DeSouza (25) represent 11-item and 7-item screeners, respectively, for somatization disorder.

<sup>b</sup> X indicates that this symptom (or equivalent) is included on the scale; ½ indicates that the two symptoms so designated constitute a single item for the scale; "X" indicates that a symptom close in type to that in the table is represented on the scale.



All neurologists are familiar with “functional” (“psychogenic”) movement disorders, but what about functional symptoms in neurological diseases and more specifically in movement disorders?

Implications for diagnosis?

Clinical practice and evaluation of treatment result?

Outcome of clinical trials?

# DSM-5 categories

## **Somatic Symptom and Related Disorders**

Somatic Symptom Disorder

Illness Anxiety Disorder

Conversion Disorder (Functional Neurological Symptom Disorder)

Psychological Factors Affecting Other Medical Conditions

Factitious Disorder

Other Specified Somatic Symptom and Related Disorder

Unspecified Somatic Symptom and Related Disorder

## **Trauma- and Stressor-Related Disorders**

Reactive Attachment Disorder

Disinhibited Social Engagement Disorder

Posttraumatic Stress Disorder

Acute Stress Disorder

Adjustment Disorders

Other Specified Trauma- and Stressor-Related Disorder

Unspecified Trauma- and Stressor-Related Disorder

# Somatic symptom disorder

## “somatische symptoomstoornis”

“formerly known as a ***somatoform disorder*** is any mental disorder which manifests as physical symptoms that suggest illness or injury, but which cannot be explained fully by a general medical condition or by the direct effect of a substance, and are not attributable to another mental disorder (e.g., panic disorder)”

# Factitious Disorder

“is a condition in which a person, without a malingering motive, acts as if they have an illness by deliberately producing, feigning, or exaggerating symptoms, purely to attain (for themselves or for another) a patient's role”



(1720 – 1797)

internal incentive is assuming the ‘sick role’, with an *absence* of external incentives altogether

primary aim is to obtain sympathy, nurturance, and attention accompanying the sick role

Factitious disorder and malingering cannot be diagnosed in the same patient

*diagnosis of factitious disorder depends on the absence of any other psychiatric disorder*

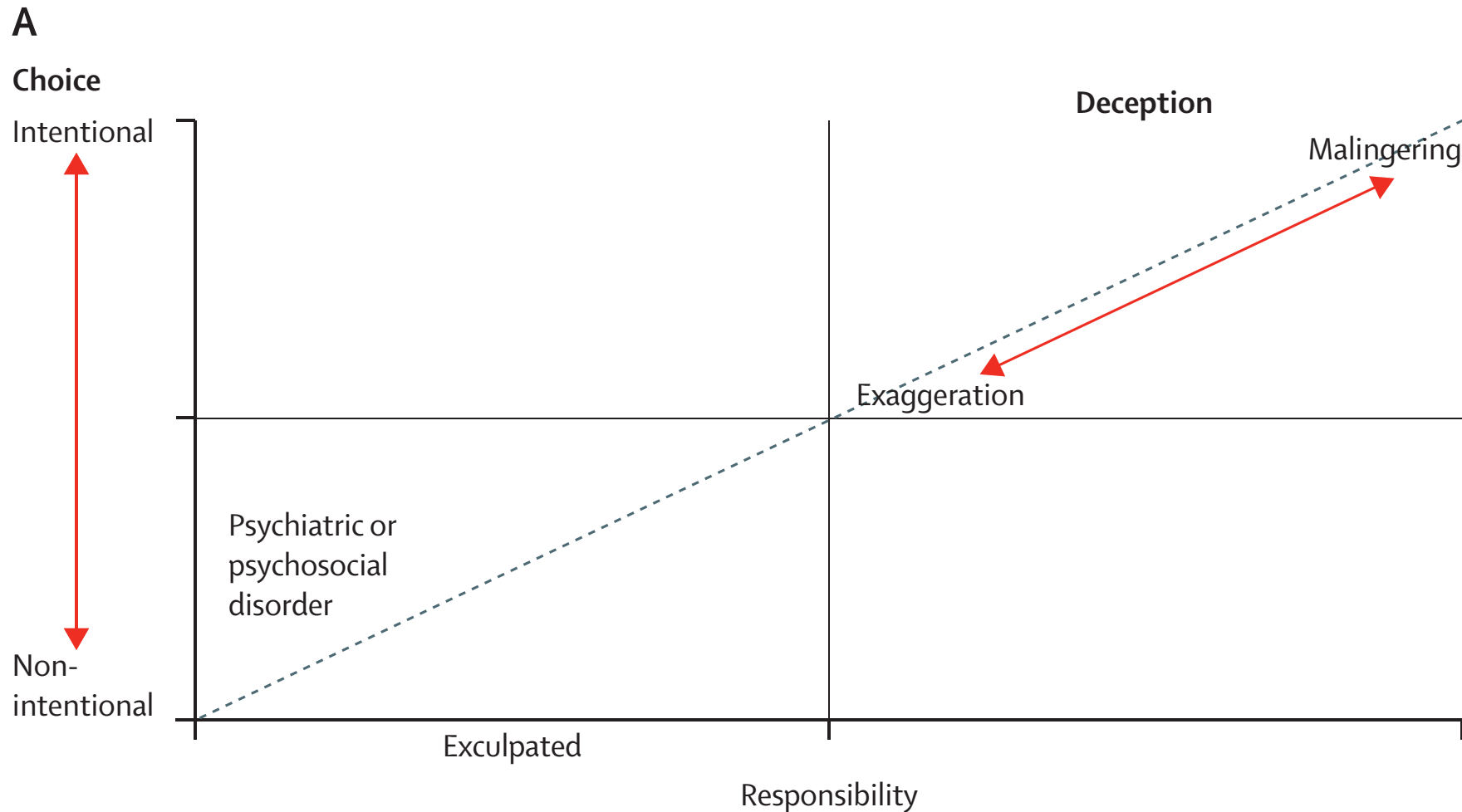
While they are both listed in the DSM-V, factitious disorder is considered a mental disorder, while malingering is not

# Malingering

*Malingering* is defined as the intentional production of false or grossly exaggerated physical or psychological symptoms in order to gain some external incentive

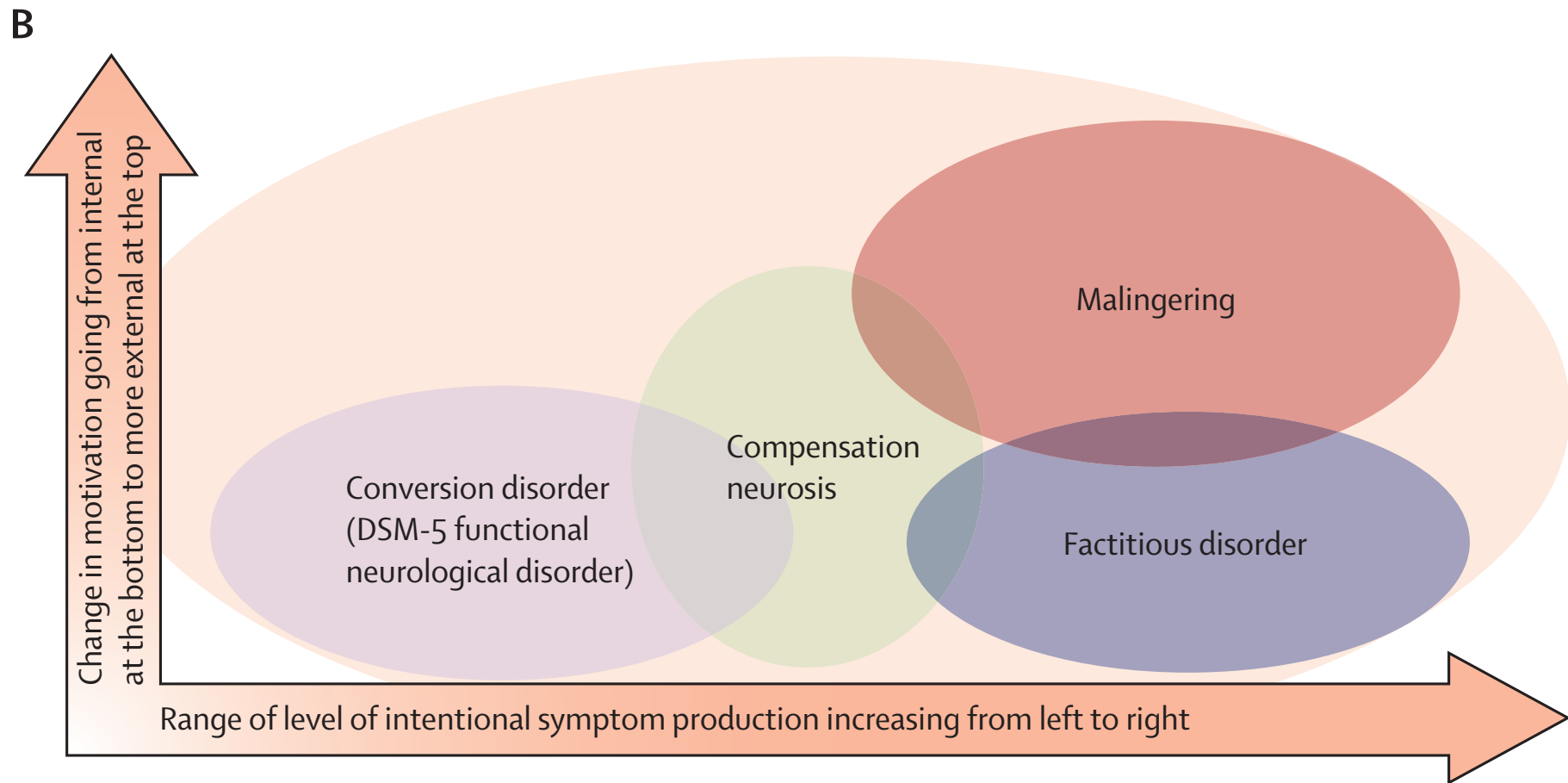
Supportive are...

- (1) an individual is presenting with symptoms within a medicolegal context
- (2) there are marked discrepancies between the person's subjective account of stress/disability and objective findings
- (3) the individual is uncooperative during evaluation or non-compliant with the prescribed treatment regimen
- (4) there is a presence of Antisocial Personality Disorder



**Figure: Two models of illness deception (A)<sup>8</sup> and compensation neurosis (B)<sup>83</sup>**

Reproduced by permission of Sage Publications (A) and American Psychiatric Press (B). Diagrams show the potential roles of patient choice, intentions, and motivation in symptom production and, ultimately, diagnosis. DSM-5=Diagnostic and Statistical Manual of Mental Disorders, fifth edition.



**Figure: Two models of illness deception (A)<sup>8</sup> and compensation neurosis (B)<sup>83</sup>**

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# DSM-5 categories

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Other Specified Trauma- and Stressor-Related Disorder

Unspecified Trauma- and Stressor-Related Disorder



# Psychological factors affecting other medical conditions (PFAOMC)

- Nonadherence to treatment
- Irritability
- Demoralization
- Psychological factors affecting medical conditions
  - Regression
  - Anxiety
  - Depression
  - Anger
  - Denial

# Primary and secondary morbid gain

**Subconscious psychological motivators** when presenting with symptoms

If these motivators are recognized by the patient, and especially if symptoms are fabricated or exaggerated for personal gain, then called malingering

**Primary morbid gain** produces positive **internal** motivations but induces stress

**Secondary morbid gain** is an **external** motivator. In the context of a person with a significant mental or psychiatric disability, this effect is sometimes called secondary handicap

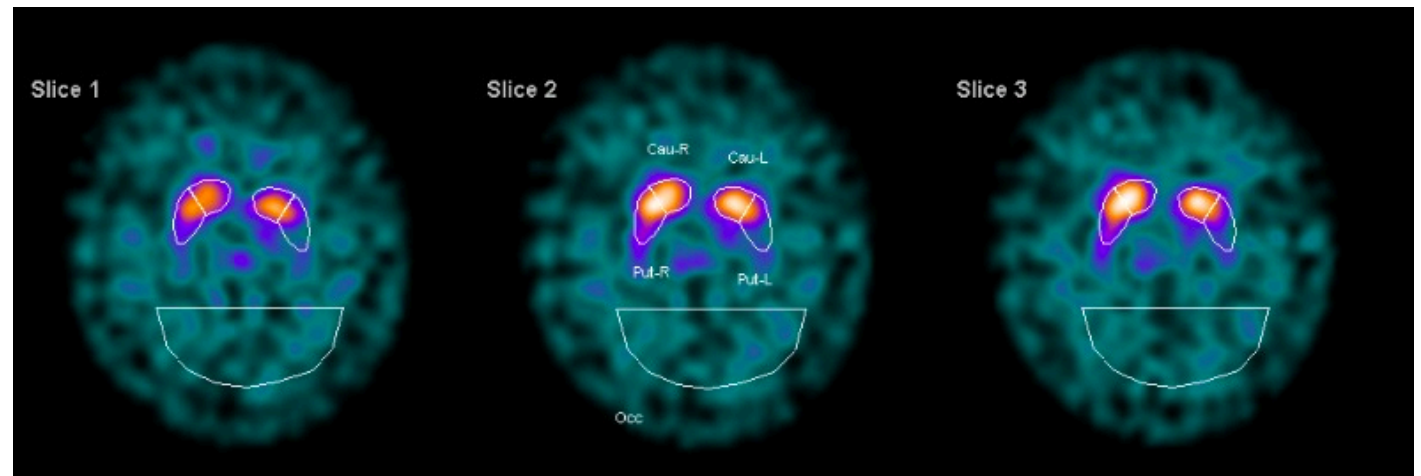
**Tertiary morbid gain**, a less well-studied process, is when a third party such as a relative or friend is motivated to gain sympathy or other benefits from the illness of the victim

# Psychodynamic theory

- Internal unresolved conflicts, emotions and wishes wanting to become conscious
- Emotional conflict shifts attention towards functional symptoms
- Primary gain is immediate relief from consequence of illness, shame, anger
- Secondary gain is more conscious external motivator, where you have to act upon and creates e.g. gain of compassion from others, sick leave, ...
- Tertiary gain is the benefit the caregivers obtain from caring for the sick person

# Case description

- Female 66 yrs
- 2011 resting tremor right hand
- Hypokinesia and rigidity right upper extremity
- DAT scan shows deficit left putamen
- Nausea and hypotension due to pramipexole
- Levodopa marginally reduces tremor
- Trihexyphenidil caused hypotension and flushing



- Diagnosis of Parkinson's disease confirmed multiple times by clinical examination, DATscan and response to therapy
- Inconsistencies in neurologic examination evident
- Beneficial effect of distraction
- Beneficial effect of entrainment
  
- Extremely concerned caregiver, retired pharmacist
- Patient was also active in pharmacy, though not trained a such

Diagnosis:

“Parkinson’s disease with psychological factors affecting...”

*In broad category of “somatic symptom and related disorders”*

# Cohort study on somatoform disorders in Parkinson disease and dementia with Lewy bodies

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 Laura Bonanni, MD,  
 PhD  
 Lamberto Manzoli, MD  
 Astrid Thomas, MD,  
 PhD

**Table 1** Comparison of the prevalence of somatoform disorders and catatonia in PD-SFMD and patients with DLB, AD, PD, PSP, MSA, and FTD<sup>a</sup>

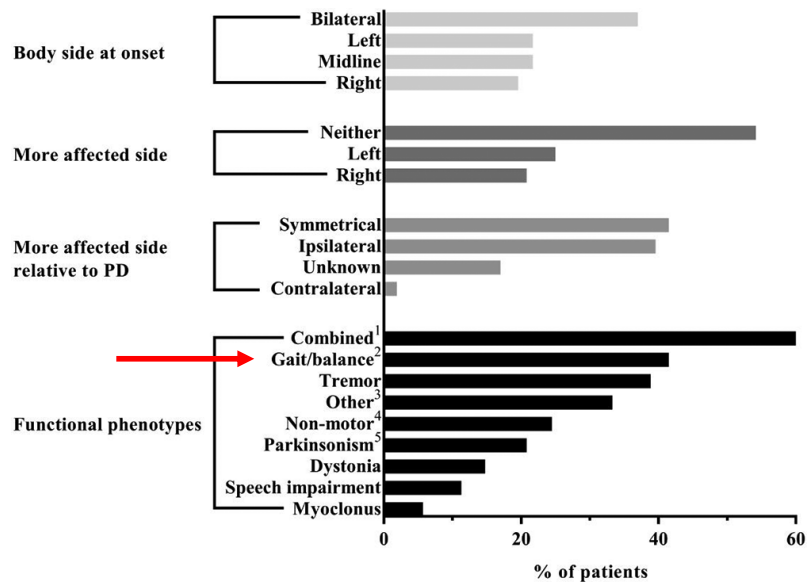
	DLB (n = 124)	AD (n = 303)	PD (n = 412)	PSP (n = 40)	MSA (n = 36)	FTD (n = 28)
Age, y, mean (SD)	70.2 (8.3)	72.0 (10.6)	63.9 (12.5)	65.1 (2.1)	64.8 (3.2)	66.0 (3.0)
MMSE, mean (SD)	22.8 (2.5)	23.5 (3.0)	27.2 (1.6)	25.2 (1.3)	26.6 (1.4)	22.0 (1.5)
FAB, mean (SD)	14.6 (2.5)	15.5 (2.8)	17.0 (3.0)	11.0 (1.3)	16.8 (1.2)	11.7 (1.8)
NPI, mean (SD)	20.5 (8.2)	11.8 (5.6)	5.0 (3.8)	6.1 (4.4)	5.5 (2.7)	14.4 (5.4)
Presence of SFMD, n (%)	15 (12.0)	3 (1.0)	29 (7.0)	1 (2.5)	0	0
SFMD interview positive, n (%)	28 (22)	7 (2.3)	40 (9.7)	1 (2.5)	0	0
No. (%) of hospitalizations	4.0 (2.6)	3.8 (2.1)	1.8 (1.6)	4.5 (2.1)	4.2 (3.0)	3.2 (2.2)
No. of hospital discharges with definite SFMD diagnosis/no. of patients	32/16	8/4	36/29	6/1	0/0	0/0

“The frequency of SFMD was higher in DLB (15 patients, 12%) and PD (29 patients, 7%) than in other neurodegenerative diseases (0%–3%). SFMD consisted of conversion motor or sensory disorders, often accompanied by delusional thought content”

*Neurology* 2010;74;1598

# Functional neurological disorders in Parkinson disease

Benjamin D Wissel,<sup>1</sup> Alok K Dwivedi,<sup>2</sup> Aristide Merola,<sup>1</sup> Danielle Chin,<sup>1</sup> Cara Jacob,<sup>1</sup> Andrew P Duker,<sup>1</sup> Jennifer E Vaughan,<sup>1</sup> Lilia Lovera,<sup>1</sup> Kathrin LaFaver,<sup>3</sup> Ariel Levy,<sup>4,5</sup> Anthony E Lang,<sup>4,5</sup> Francesca Morgante,<sup>6,7</sup> Melissa Jill Nirenberg,<sup>8</sup> Christopher Stephen,<sup>9</sup> Nutan Sharma,<sup>9</sup> Alberto Romagnolo,<sup>10</sup> Leonardo Lopiano,<sup>10</sup> Bettina Balint,<sup>11,12,13</sup> Xin X Yu,<sup>14</sup> Kailash P Bhatia,<sup>11</sup> Alberto J Espay<sup>1</sup>



**Figure 1** Clinical characteristics of functional symptoms. (a) Two or more functional symptoms. (b) Gait/balance functional phenotypes were subcategorised as excessive retropulsion (n=6), astasia-abasia (n=6), deliberately effortful (n=4), knee buckling (n=4) and other (n=8). (c) 'Other' functional phenotypes included severe dyskinesia/shaking spells (n=13). (d) Non-motor functional phenotypes were subcategorised as pain (n=8), cognitive decline (n=2), nausea (n=2), fatigue (n=1) and other (n=2). (e) Parkinsonism with very clear functional features distinct from the 'organic' aspects found in the same patient (ie, 'functional overlay'). PD, Parkinson disease.

“We found that PD patients with functional features were on higher dopaminergic medication dosages, had more dyskinesia, exhibited greater depression and anxiety symptoms, and required more attention by clinicians than age-matched, gender-matched and disease duration-matched PD patients without functional complications. “



# Pathophysiology

- Most patients developed their FMD on the same side as physical deficit
- Underlying pathological process in PD predisposes patients to an abnormal “attention-full” mode of movement
- Abnormal self-directed attention is also likely to enhance perception of normal physiological sensations
- Predisposing personality traits
- Additional cognitive/affective factors
- Role of caregiver

# Attachment theory & Influence on chronic illness

- Attachment theory is able to predict either the vulnerability or resilience to stressful life events
- Is developed in infancy through interaction with caregiver, and persists through adulthood
- motivational system involved in the dynamics of the coping process
- Attachment hyperactivation as a secondary strategy to satisfy care need of an anxiously-attached adult
- Insecure about availability and supportiveness of spouse, doubt about self-worth, seeking assurance

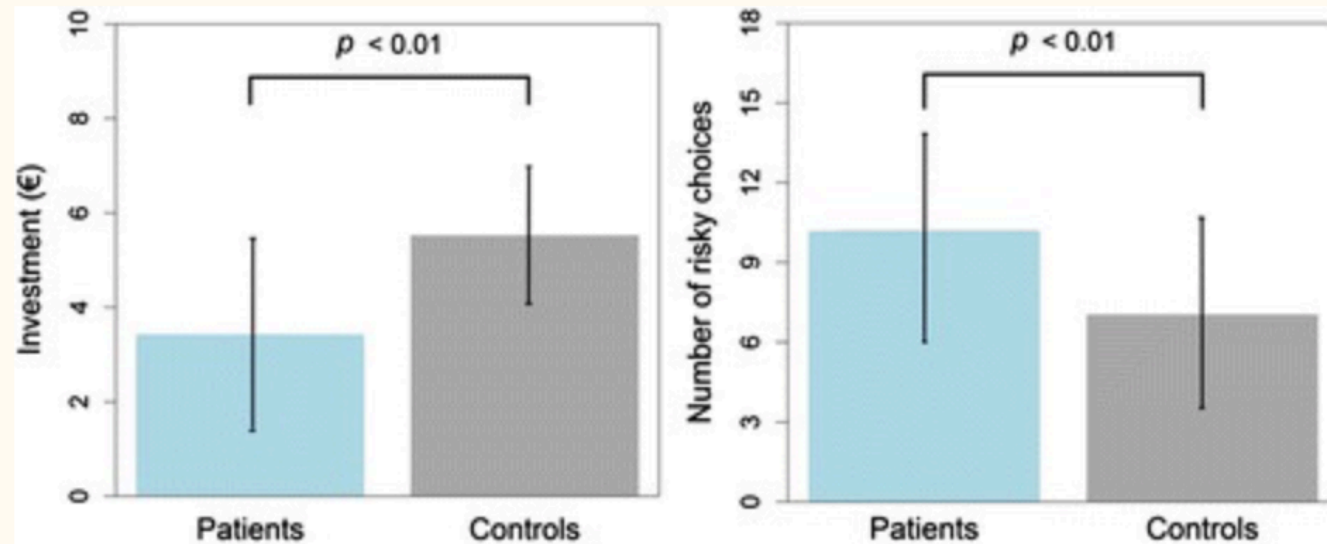
# Attachment style & chronic diseases

- Relationship among attachment, affect regulation and coping has rarely been investigated within the context of coping with chronic disease
- Predict the subjective emotional and physical health status
- Observed by adult attachment interview (AAPR coding system) and coping interview (Bernese Coping Modes)
- Disease characteristics also influencing observed attachment style

# Trust behavior in Parkinson's disease

- Trust is a fundamental prerequisite for various kinds of relationships in both private and public life
- Patient-physician relationship and therapy adherence
- Psychological state comprising the intention to accept vulnerability based on positive expectations about the actions of another party
- Risk perception, a precondition for trust, substantially regulated in the amygdala, insular cortex and other parts of the limbic system
- Process of 'mentalizing' related paracingulate and medial prefrontal cortex

# Trust behavior in Parkinson's disease



TRUST

RISK

Fig. 1

Results of the trust game (left side) and the Game-of-Dice Task (right side). The diagram on the left shows overall mean investments in the trust game (trust behavior). The diagram on the right shows the mean number of risky choices in the Game-of-Dice Task (risky decision making)

Data show reduced trust and increased risk behavior  
Javor et al. BMC Neurol. 2015; 15: 126

# Conclusions

- Functional neurological symptoms more frequent in PD
- Terminology important to avoid miscomprehension, overtreatment and stigma
- Clear implications for diagnosis, assessment of disease severity and treatment
- Shift from habitual to goal-directed motor control provides an explanation for the vulnerability of patients with PD
- Altered position in the world due to mobility and movement symptoms
- Fundamentally reshapes relationships and introduces shifts in role patterns influencing sickness behavior
- Attachment style theory to be further explored

