

SECONDARY  
INFLUENCES ON  
COGNITIVE  
FUNCTIONING

# SECONDARY INFLUENCES ON COGNITIVE FUNCTIONING

## COGNITIVE DEFICITS ASSOCIATED WITH SPECIFIC PSYCHOLOGICAL DISORDERS

- ELEVATED FREQUENCY OF CO-OCCURRING PSYCHOLOGICAL, MEDICAL, AND MEDICAL CONDITIONS
- BETTER COGNITIVE FUNCTION = BETTER PSYCHOLOGICAL OUTCOMES (REGARDLESS OF DIAGNOSIS)

## SECONDARY CONDITIONS INFLUENCING COGNITIVE PERFORMANCE

- FATIGUE
- PAIN

## SOMATOFORM AND FACTITIOUS DISORDERS

## SYMPTOM VALIDITY TESTING – DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE



# COGNITIVE DEFICITS ASSOCIATED WITH PSYCHOLOGICAL DISORDERS

## DEPRESSION

- STRUCTURAL AND FUNCTIONAL ABNORMALITIES ASSOCIATED WITH DEPRESSION
  - REDUCED CEREBRAL VOLUME IN ORBITAL AND DORSOLATERAL PREFRONTAL CORTEX, ANTERIOR CINGULATE, HIPPOCAMPUS, AMYGDALA, CEREBELLUM, AND BASAL GANGLIA
  - HYPOMETABOLISM IN PREFRONTAL CORTEX, MEDIAL FRONTAL CORTEX, AND BASAL GANGLIA
  - CHANGES PRESENT DURING INITIAL DEPRESSIVE EPISODE AND ARE DUE TO BOTH REDUCED GLIAL CELL COUNTS/DENSITY AND DECREASED NEURONAL DENSITY



# COGNITIVE DEFICITS ASSOCIATED WITH PSYCHOLOGICAL DISORDERS

## DEPRESSION

- COGNITIVE DEFICITS ASSOCIATED WITH DEPRESSION
  - EXECUTIVE FUNCTIONING, MEMORY, WORKING MEMORY, PROCESSING SPEED, PERFORMANCE OF ADLs
  - COGNITIVE DEFICITS OBSERVED DURING FIRST DEPRESSIVE EPISODE – REDUCED PROCESSING SPEED, LEARNING/MEMORY, EXECUTIVE FUNCTIONING
- FACTORS MEDIATING RELATIONSHIP BETWEEN DEPRESSION AND POORER COGNITIVE PERFORMANCE
  - DEPRESSION SEVERITY, PSYCHIATRIC HOSPITALIZATION, ADVANCING AGE, PRESENCE OF PSYCHOSIS, CO-OCCURRING ANXIETY
- DIFFERENCES IN NEUROPSYCHOLOGICAL TESTING PERFORMANCE BETWEEN PERSONS WITH ALZHEIMER'S DISEASE AND DEPRESSION
  - WITH ALZHEIMER'S DISEASE YOU OBSERVE: MORE RAPID RATE OF FORGETTING, REDUCED INCIDENTAL LEARNING, GREATER DEFICITS IN LANGUAGE, PRAXIS, AND ABSTRACTION



# COGNITIVE DEFICITS ASSOCIATED WITH PSYCHOLOGICAL DISORDERS

## ANXIETY

- ONLY CONSISTENT NEUROIMAGING FINDING: AMYGDALA
- INCREASED ANXIETY RESULTS IN PROGRESSIVE CONSTRAINTS ON BREADTH OF ATTENTION FOCUS
  - AT LOW LEVELS - PERFORMANCE IMPROVED BECAUSE OF REDUCED PROCESSING OF TASK-IRRELEVANT CUES WITHOUT REDUCTION IN PROCESSING OF CENTRAL TASK-RELEVANT CUES
  - AT HIGHER LEVELS – PERFORMANCE DECLINES BECAUSE PROGRESSIVE NARROWING OF ATTENTION COMPROMISES PROCESSING OF TASK RELEVANT INFORMATION/CUES
- ANXIOUS PEOPLE PREFERENTIALLY EMPLOY WORKING MEMORY RESOURCES TO PROCESS INFORMATION THAT'S HIGHLY RELEVANT TO THEIR ANXIETY-RELATED CONCERNS
- ALLOCATION OF COGNITIVE CAPACITY IN A BIASED MANNER VERSUS REDUCED COGNITIVE CAPACITY
  - DIRECT COGNITIVE RESOURCES TO SELECTIVELY PROCESS INFORMATION RELEVANT TO ANXIETY-RELATED CONCERNS



# COGNITIVE DEFICITS ASSOCIATED WITH PSYCHOLOGICAL DISORDERS

## ANXIETY

- MEMORY OPERATES IN A BIASED MANNER
  - THREATENING INFO FROM PAST DISPROPORTIONALITY ACCESSIBLE
  - THIS CONTRIBUTES TO DISTORTED EXPECTATIONS ABOUT FUTURE
- JUDGEMENT FORMATION GIVES EXTRA WEIGHT TO THREATENING INFORMATION WHICH OVERESTIMATES LIKELIHOOD OF FUTURE NEGATIVE EVENTS AND COST ASSOCIATED WITH THEM
  - VERY ROBUST RESEARCH FINDING
- PROCESSING PRIORITIES IN ATTENTION – PREFERENTIAL DIRECTING OF ATTENTION RESOURCES TO TASK-IRRELEVANT BUT ANXIETY-RELATED INFORMATION
- COGNITIVE CONTENT IN ANXIETY INVOLVES THE PREDOMINANCE OF THREAT-RELATED THINKING



# SECONDARY CONDITIONS INFLUENCING COGNITIVE PERFORMANCE

## FATIGUE

- ONE OF THE MOST COMMON SYMPTOMS ASSOCIATED WITH MEDICAL, NEUROLOGICAL, AND PSYCHOLOGICAL CONDITIONS
- NEUROIMAGING FINDINGS – OBJECTIVE AND SUBJECTIVE FATIGUE ASSOCIATED WITH INCREASED ACTIVATION OF STRIATAL-FRONTO-THALAMIC STRUCTURES
- MOOD MEDIATES RELATIONSHIP BETWEEN FATIGUE AND COGNITIVE PERFORMANCE ON MORE SIMPLE TASKS
- DIRECT RELATIONSHIP BETWEEN FATIGUE AND TASKS REQUIRING GREATER EXECUTIVE FUNCTIONING DEMANDS
- PROLONGED EFFORT MAY RESULT IN GREATER SUBJECTIVE FATIGUE BUT DOES NOT NECESSARILY RESULT IN SUBSEQUENT COGNITIVE PERFORMANCE DEFICITS
- PERFORMANCE DECREMENTS DURING SUSTAINED COGNITIVE EFFORT BEST WAY TO OBJECTIVELY DOCUMENT IMPACT OF COGNITIVE FATIGUE



# SECONDARY CONDITIONS INFLUENCING COGNITIVE PERFORMANCE

## PAIN

- INVESTIGATING INFLUENCE OF PAIN ON COGNITION COMPLICATED BY FACT THAT PAIN RARELY OCCURS IN ISOLATION
- MOST CONSISTENT COGNITIVE PROBLEMS ASSOCIATED WITH PAIN: REDUCED ATTENTION, MENTAL FLEXIBILITY, AND RECENT MEMORY PERFORMANCE & SLOWED PROCESSING SPEED AND PSYCHOMOTOR SPEED
  - ANXIETY/PAIN-RELATED FEAR – REDUCED MEMORY PERFORMANCE
  - SLEEP DISTURBANCE/FATIGUE DUE TO PAIN – SLOWED SPEED
  - NEUROPATHIC PAIN – REDUCED PROBLEM-SOLVING
- PAIN DURATION MORE PREDICTIVE OF COGNITIVE DYSFUNCTION THAN PAIN INTENSITY
- HIGHER LEVELS OF PAIN “CATASTROPHIZING” ASSOCIATED WITH INCREASED ATTENTION PROBLEMS – DIFFICULT TO SUPPRESS PAIN-RELATED THOUGHTS



# SOMATOFORM AND FACTITIOUS DISORDERS

## MIND-BODY DECEPTIONS

### FACTITIOUS DISORDER AND MALINGERING

*THE MIND DECEIVES OTHER MINDS*

- ACTIVE DECEPTION FOR EXTERNAL GAIN – MALINGERING
- ACTIVE DECEPTION FOR INTERNAL GAIN – FACTITIOUS DISORDER
  
- DECEPTION IS FUNDAMENTAL TO SURVIVAL AND CAN BE ADAPTIVE
- EVERYONE HAS MALINGERED AT SOME TIME IN HER/HIS LIFE



# SOMATIFORM AND FACTITIOUS DISORDERS

## MIND-BODY DECEPTIONS

### SOMATIFORM DISORDERS

*THE MIND DECEIVES THE MIND AND THE BODY*

- SOMATIZATION DISORDER AND CONVERSION DISORDER
  - EMOTIONAL DISTRESS AND OTHER MENTAL PHENOMENON ARE CONVERTED INTO BODILY SYMPTOMS
  - DISORDER IS ENTIRELY MENTAL BUT FEELS ENTIRELY PHYSICAL
  - WHEN A PERSON CANNOT PROCESS EMOTIONS ON A PSYCHOLOGICAL LEVEL THE CONFLICT IS “TRANSLATED” TO THE BODY

WE ALL SOMATICIZE, ESPECIALLY DURING TIMES OF STRESS



# SOMATOFORM AND FACTITIOUS DISORDERS

## RELATIONSHIP BETWEEN SOMATOFORM AND FACTITIOUS DISORDERS

	External Goal	Internal Goal
Conscious	Malingering	Factitious Disorder
Unconscious		Somatoform Disorders



# FACTITIOUS DISORDER

- INTENTIONAL PRODUCTION OF PHYSICAL OR PSYCHOLOGICAL SYMPTOMS – MOTIVATION FOR BEHAVIOR IS TO ASSUME THE SICK ROLE/RECEIVE MEDICAL TREATMENT
- PREVALENCE
  - LITTLE DATA AVAILABLE - 1% OF HOSPITALIZED PATIENTS FOR WHOM MENTAL HEALTH PROFESSIONALS CONSULTED
  - MORE COMMON IN FEMALES BUT MOST CHRONIC AND SEVERE CASES MORE FREQUENTLY IN MALES
- COURSE
  - ONSET IN EARLY ADULTHOOD OFTEN AFTER HOSPITALIZATION FOR MEDICAL/PSYCHOLOGICAL TREATMENT
- PREDISPOSING FACTORS
  - PRESENCE OF MEDICAL/PSYCHOLOGICAL DISORDER DURING CHILDHOOD OR ADOLESCENCE THAT LEAD TO EXTENSIVE HOSPITALIZATION
  - FAMILY DISRUPTION AND/OR ABUSE IN CHILDHOOD
  - EMPLOYMENT IN MEDICAL PROFESSION



# MALINGERING

- INTENTIONAL PRODUCTION OF FALSE OR GROSSLY EXAGGERATED PHYSICAL OR PSYCHOLOGICAL SYMPTOMS
- MOTIVATED BY EXTERNAL INCENTIVE LIKE AVOIDING WORK OR MILITARY DUTY, OBTAINING FINANCIAL COMPENSATION, EVADING CRIMINAL PROSECUTION, OBTAINING DRUGS
- SUSPECT IF:
  - MEDICO-LEGAL CONTEXT OF PRESENTATION
  - MARKED DISCREPANCY BETWEEN PERSON'S CLAIMED STRESS/INJURY AND OBJECTIVE FINDINGS
  - LACK OF COOPERATION DURING EXAMINE AND COMPLYING WITH PRESCRIBED TREATMENT
- BASE RATE  $\geq$  50% OF RANGE OF CIVIL AND CRIMINAL SETTINGS
- COGNITIVE OPERATIONS INVOLVED IN DECEPTIVE BEHAVIOR
  - REQUIRES COMPLEX COGNITIVE PROCESSING AND GREATER MENTAL CONTROL
  - EXECUTIVE FUNCTIONS – INHIBITORY CONTROL, COMPLEX ATTENTION, COGNITIVE FLEXIBILITY
  - fMRI RESULTS CONSISTENTLY DEMONSTRATE ANTERIOR VERSUS POSTERIOR ACTIVATION



# SOMATIZATION DISORDER

- HISTORY OF MANY PHYSICAL COMPLAINTS BEGINNING PRIOR TO AGE 30, OCCURRING OVER SEVERAL YEARS, RESULTING IN TREATMENT SEEKING &/OR SIGNIFICANT IMPAIRMENT IN SOCIAL, OCCUPATIONAL, OR OTHER AREAS OF FUNCTION
- SYMPTOMS ARE NOT INTENTIONALLY PRODUCED
- MUST MEET EACH OF THESE CRITERIA:
  - 4 PAIN SYMPTOMS LOCATED IN DIFFERENT AREAS
  - 2 GASTROINTESTINAL SYMPTOMS
  - 1 SEXUAL SYMPTOM
  - 1 PSEUDONEUROLOGICAL SYMPTOM
- MUST MEET EITHER OF THESE:
  - AFTER APPROPRIATE INVESTIGATION, ABOVE SYMPTOMS CANNOT BE FULLY EXPLAINED BY A MEDICAL CONDITION/SUBSTANCE ABUSE
  - WHEN THERE IS A MEDICAL CONDITION, SYMPTOMS OR IMPAIRMENT IS EXCESSIVE



# SOMATIZATION DISORDER

- ASSOCIATED FEATURES
  - USUALLY DESCRIBE COMPLAINTS IN EXAGGERATED, COLORFUL TERMS WITHOUT MUCH SPECIFIC FACTUAL INFORMATION
  - OFTEN INCONSISTENT HISTORIANS
  - OFTEN SEEK TREATMENT FROM SEVERAL PROFESSIONALS CONCURRENTLY
  - ANXIOUS AND DEPRESSED MOOD ARE COMMON

# SOMATIZATION DISORDER

- PREVALENCE
  - LIFETIME RATES FOR WOMEN IN USA: 0.2 TO 2%
  - LIFETIME RATES FOR MEN IN USA: <0.2%
  - MUST CONSIDER CULTURAL INFLUENCES
- COURSE
  - CHRONIC BUT FLUCTUATING DISORDER THAT RARELY REMITS
- FAMILIAL PATTERNS
  - OBSERVED IN 10-20% OF FEMALE FIRST-DEGREE RELATIVES
  - MALES SHOW INCREASED RISK OF ANTISOCIAL PERSONALITY DISORDER AND/OR SUBSTANCE ABUSE



# CONVERSION DISORDER

- ONE OR MORE SYMPTOMS AFFECTING VOLUNTARY MOTOR OR SENSORY FUNCTION SUGGESTING A NEUROLOGICAL OR MEDICAL CONDITION
- PSYCHOLOGICAL FACTORS ARE JUDGED TO BE ASSOCIATED WITH THE SYMPTOMS BECAUSE THE INITIATION OR EXACERBATION OF THESE SYMPTOMS IS PRECEDE BY CONFLICTS/STRESSORS
- SYMPTOMS ARE NOT INTENTIONALLY PRODUCED (I.E. NOT UNDER VOLUNTARY CONTROL)
- SYMPTOMS CANNOT, AFTER APPROPRIATE INVESTIGATION, BE FULLY EXPLAINED BY A MEDICAL CONDITION OR THE DIRECT EFFECTS OF A SUBSTANCE (OR AS A CULTURALLY SANCTIONED BEHAVIOR OR EXPERIENCE)
- SYMPTOMS CAUSE CLINICALLY SIGNIFICANT DISTRESS OR IMPAIRMENT IN SOCIAL, OCCUPATIONAL, OR OTHER FUNCTIONING.



# CONVERSION DISORDER

- ASSOCIATED FEATURES:
  - MAY SHOW *LA BELLE INDIFFERENCE* OR MAY PRESENT IN A DRAMATIC, HISTRIONIC MANNER
  - DUE TO SUGGESTIBILITY, SYMPTOMS MAY BE MODIFIED OR RESOLVED BASED ON EXTERNAL CUES
  - SYMPTOMS MORE COMMON FOLLOWING EXTREME PSYCHOSOCIAL STRESS
  - IMMEDIATE CAUSE OF PHYSICAL SYMPTOMS IS PSYCHOLOGICAL MECHANISM BUT OFTEN A SOMATIC DISEASE UNDERLIES THAT FACT.
  - INTOLERABLE MEMORIES/IDEAS/FEELINGS RELOCATED FROM MIND TO BODY. WHILE THIS HELPS THE SUFFERER AVOID SOMETHING UNBEARABLE (IF RECOGNIZED), IT ISOLATES THE HIDDEN EMOTIONS FROM THE CURATIVE POWER OF THE MIND.



# CONVERSION DISORDER

- PREVALENCE
  - 0.5 TO 1.1% OF GENERAL POPULATION
  - 1 TO 14% OF GENERAL MEDICAL/SURGICAL POPULATION
  - LIFETIME RATES FOR WOMEN IN USA: 0.2 TO 2%
  - LIFETIME RATES FOR MEN IN USA: <0.2%
- COURSE
  - MUST CONSIDER CULTURAL INFLUENCES
  - ONSET TYPICALLY AGE 10-35. LATER ONSET ASSOCIATED WITH GREATER PROBABILITY OF ACTUAL NEUROLOGICAL/MEDICAL CONDITION
  - ACUTE ONSET, SHORT-DURATION OF SYMPTOMS, RECURRENCE COMMON
- FAMILIAL PATTERNS – NO SOLID DATA



# HOW EMOTIONS BECOME PHYSICAL SYMPTOMS

- ABILITY TO COPE WITH STRESS IS END RESULT OF INTERPLAY BETWEEN INBORN RESPONSE STYLE, EXPERIENCE WITH STRESS, AND RELATIONSHIP WITH OTHERS
- MIND DOES NOT “DEVELOP” BEYOND THE STAGE AT WHICH FEELINGS ARE PURELY PHYSICAL SO DISTRESS IS COMMUNICATED IN BEHAVIOR CONCEALED WITHIN PHYSICAL DYSFUNCTION
- PAINFUL EARLY LIFE EXPERIENCES RESULT IN UNBERABLE FEELINGS THAT CONSCIOUS MIND RELEGATES TO THE UNCONSCIOUS. BUT REPRESSING EMOTIONS DOES NOT MAKE THEM GO AWAY, IT JUST CONCEALS THEIR INFLUENCE
- PEOPLE WHO HAVE LEARNED THAT IT IS “WRONG” OR THREATENING TO EXPRESS FEELINGS/NEEDS DIRECTLY MUST RELAY ON THEIR BODIES TO COMMUNICATE PSYCHOLOGICAL STATES INDIRECTLY



# HOW EMOTIONS BECOME PHYSICAL SYMPTOMS

- A FAMILY ENVIRONMENT THAT RESPONDS TO ILLNESS BUT IGNORES EMOTIONS SO CHILD LEARNS TO COERCE REWARDS THROUGH ILLNESS
- MEDICINE, SOCIETY, & INSURANCE COMPANIES OFFER DECEPTIVE REWARDS
  - MEDICAL STAFF TAUGHT TO RECOGNIZE TANGIBLE/OBSERVABLE/OBJECTIVE FINDING VERSUS FEELING/EMOTIONS/NEEDS
  - INSURANCE COMPANIES ENCOURAGE PEOPLE TO PAY ATTENTION TO THE BODY WHILE IGNORING THE MIND



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

- NEUROIMAGING FINDINGS
- EVIDENCE OF NON- OR LESS CREDIBLE-COGNITIVE PERFORMANCE
- SYMPTOM VALIDITY TESTING



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

## NEUROIMAGING FINDINGS

- NO LATERALIZING DIFFERENCES
- CONSISTENTLY ANTERIOR VERSUS POSTERIOR
  - MIDDLE, INFERIOR, AND SUPERIOR FRONTAL CORTEX
  - ANTERIOR CINGULATE
- PREFRONTAL/EXECUTIVE FUNCTIONING
  - INHIBITORY CONTROL – PREPOTENT TENDENCY TO RESPOND HONESTLY
  - CONFLICT MONITORING AND RESOLUTION
  - GENERATIVITY OF FALSEHOODS
  - TRACKING/MAINTAINING FALSEHOODS



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

## EVIDENCE OF NON- OR LESS CREDIBLE-COGNITIVE PERFORMANCE

- DISCREPANCY BETWEEN TEST DATA AND KNOWN PATTERNS OF BRAIN DYSFUNCTION
- DISCREPANCY BETWEEN TEST DATA AND OBSERVED BEHAVIOR
- DISCREPANCY BETWEEN TEST DATA AND RELIABLE COLLATERAL REPORTS
- DISCREPANCY BETWEEN TEST DATA AND DOCUMENTED BACKGROUND HISTORY
- FAILURE ON MULTIPLE SYMPTOM VALIDITY TESTS DURING NEUROPSYCHOLOGICAL ASSESSMENT



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

## SYMPTOM VALIDITY TESTING (SVT)

- ASSIST IN DETERMINING IF EFFORT IS SUFFICIENT TO PRODUCE VALID DATA
- FREE-STANDING VERSUS EMBEDDED & FORCED CHOICE VERSUS NON-FORCED CHOICE
- FAILURE ON MULTIPLE MEASURES = MUST DOUBT EXTENT THAT NEUROCOGNITIVE DATA OBTAINED ARE A VALID REFLECTION OF TRUE CAPABILITIES BUT DOES NOT MEAN THAT USEFUL INFORMATION CANNOT BE EXTRACTED FROM PERFORMANCES
- MUST USE MULTIPLE MEASURES BECAUSE COGNITIVE EFFORT NORMALLY FLUCTUATES THROUGHOUT COURSE OF EVALUATION AND MULTIPLE MEASURES YIELD NON-REDUNDANT INFORMATION ABOUT COGNITIVE EFFORT



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

## SYMPTOM VALIDITY TESTING (SVT)

- FORCED-CHOICE MEASURES
  - PRIMARILY CHECK FOR VERACITY OF PERFORMANCE ON MEMORY TESTS
  - EXAMINEE EXPOSED TO A SERIES OF STIMULI WHICH ARE SUBSEQUENTLY EACH PAIRED WITH A NOVEL STIMULI AND EXAMINEE ASKED TO IDENTIFY THE PREVIOUSLY SEEN ITEM
  - PERFORMANCE WORSE THAN CHANCE (E.G.,  $\leq 17$  OUT OF 50) – SUGGESTS EXAMINEE KNEW CORRECT ANSWER AND INTENTIONALLY CHOSE INCORRECT ANSWER
- WORD MEMORY TEST, TEST OF MEMORY MALINGERING, COMPUTERIZED ASSESSMENT FOR RESPONSE BIAS



# DETECTION OF CREDIBLE/NON-CREDIBLE COGNITIVE PERFORMANCE

## SYMPTOM VALIDITY TESTING (SVT)

- NON-FORCED CHOICE MEASURES
  - ALLOW FOR ARRAY OF RESPONSES AND CAN EVALUATE FOR RESPONSE BIAS ACROSS A VARIETY OF DOMAINS
  - LESS IDENTIFIABLE AS “EFFORT” TESTS
- REY 15-ITEM TEST, DOT COUNTING, RELIABLE DIGIT SPAN, EFFORT EQUATIONS FROM VARIOUS MEMORY TESTS