

Making “Neuro” Work For you

Opportunities for students and
professionals in law and psychology



American Psychology-Law Society

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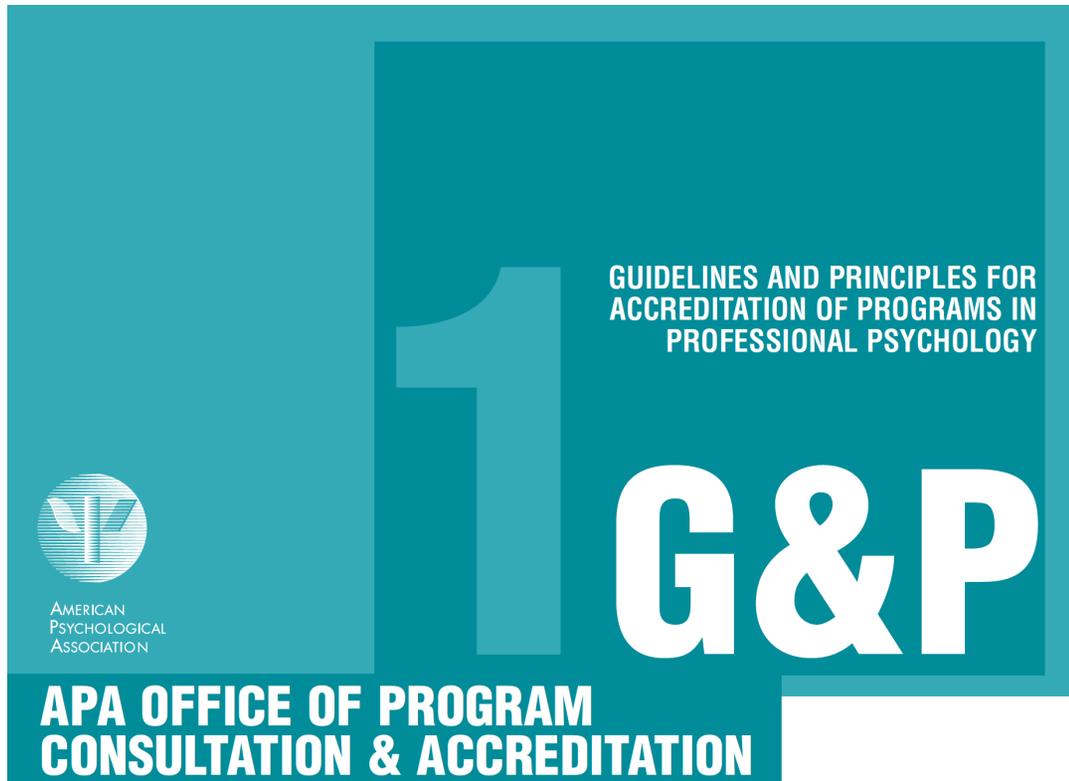


Beyond “Biological Aspects of Behavior”

Opportunities in
graduate training

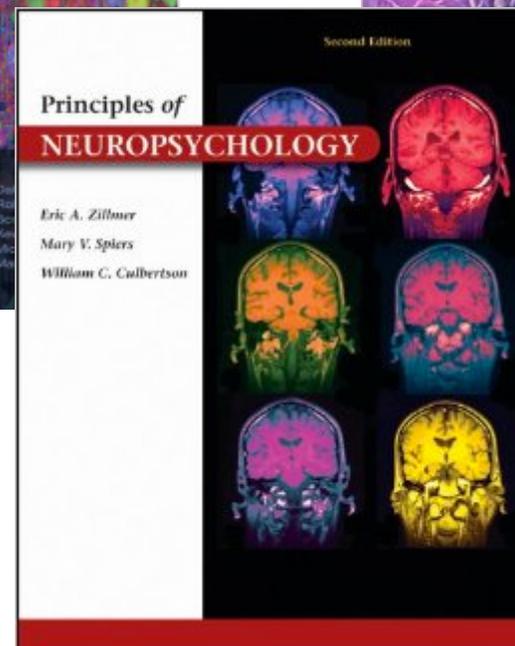
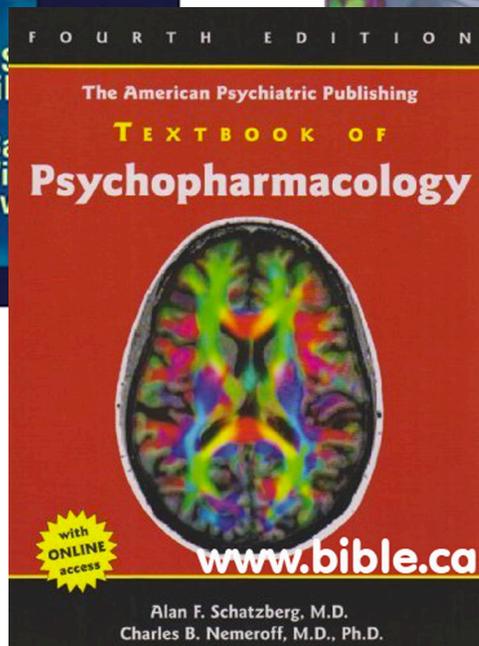
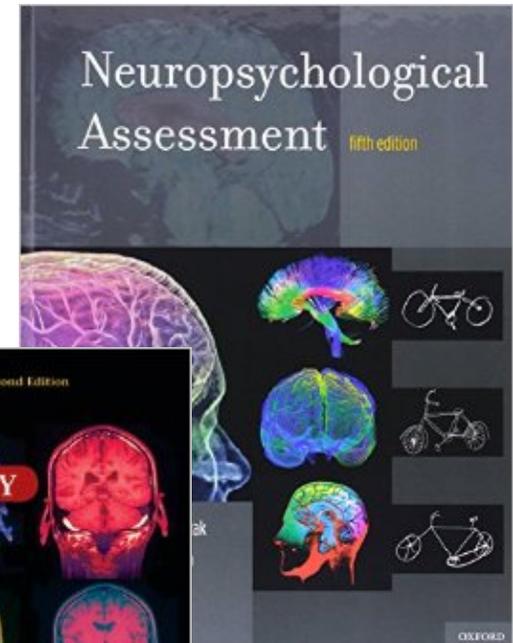
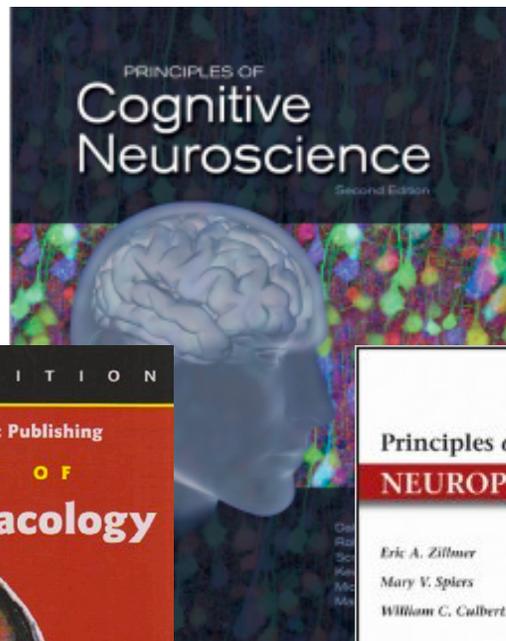
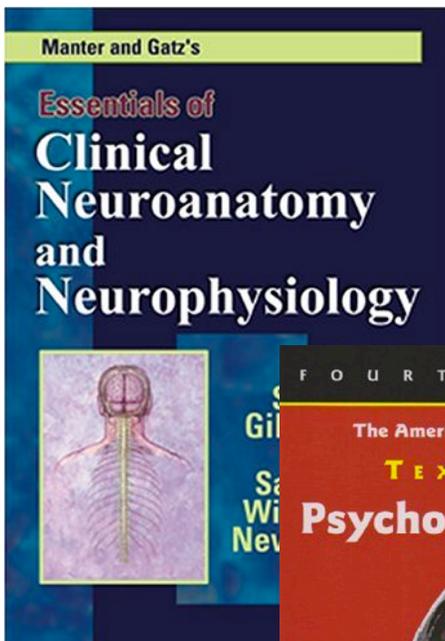
Casey LaDuke
Drexel University

APA Guidelines and Principles

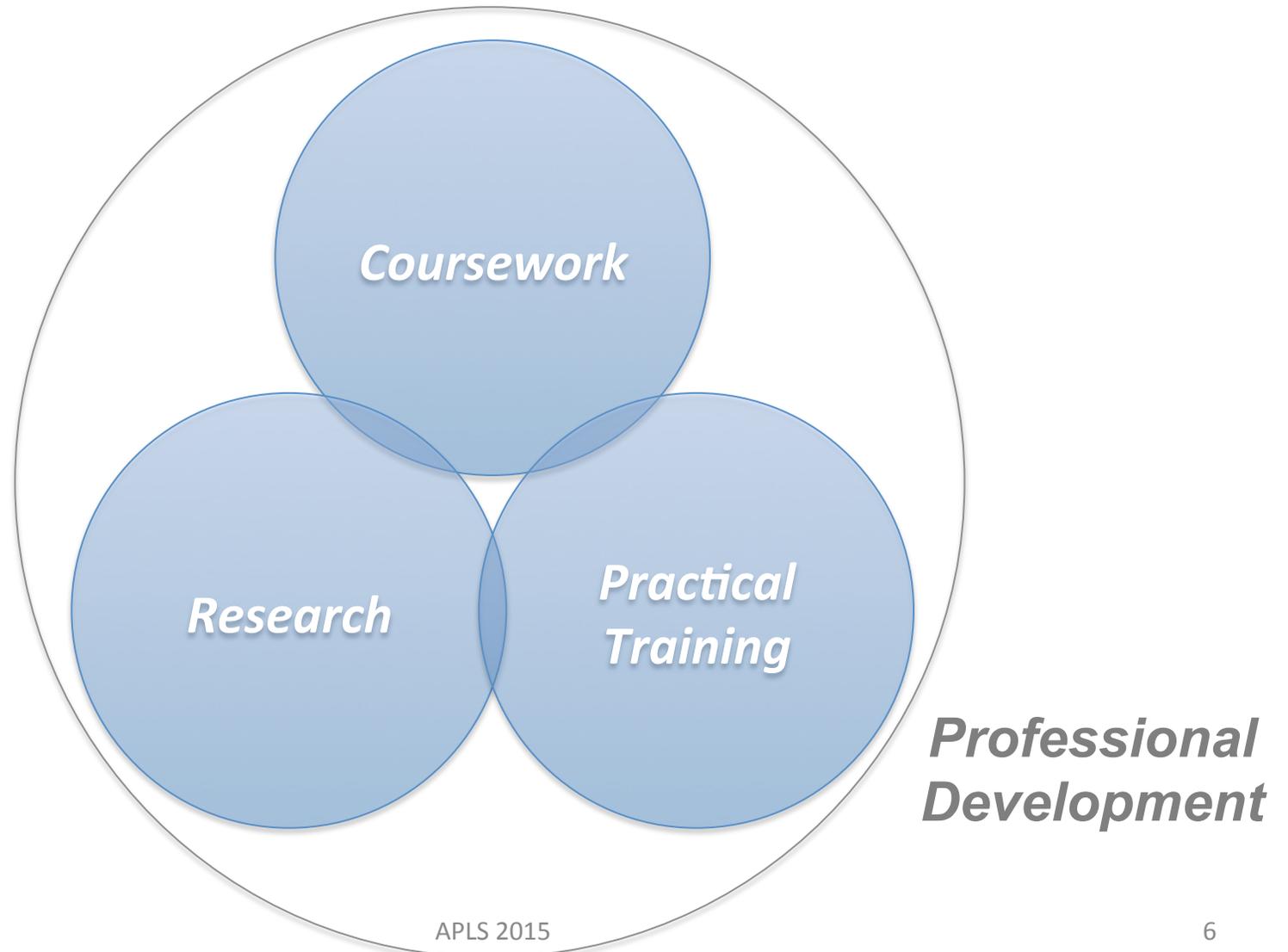


*... biological aspects of behavior
(A.B.3.a; APA, 2013)*

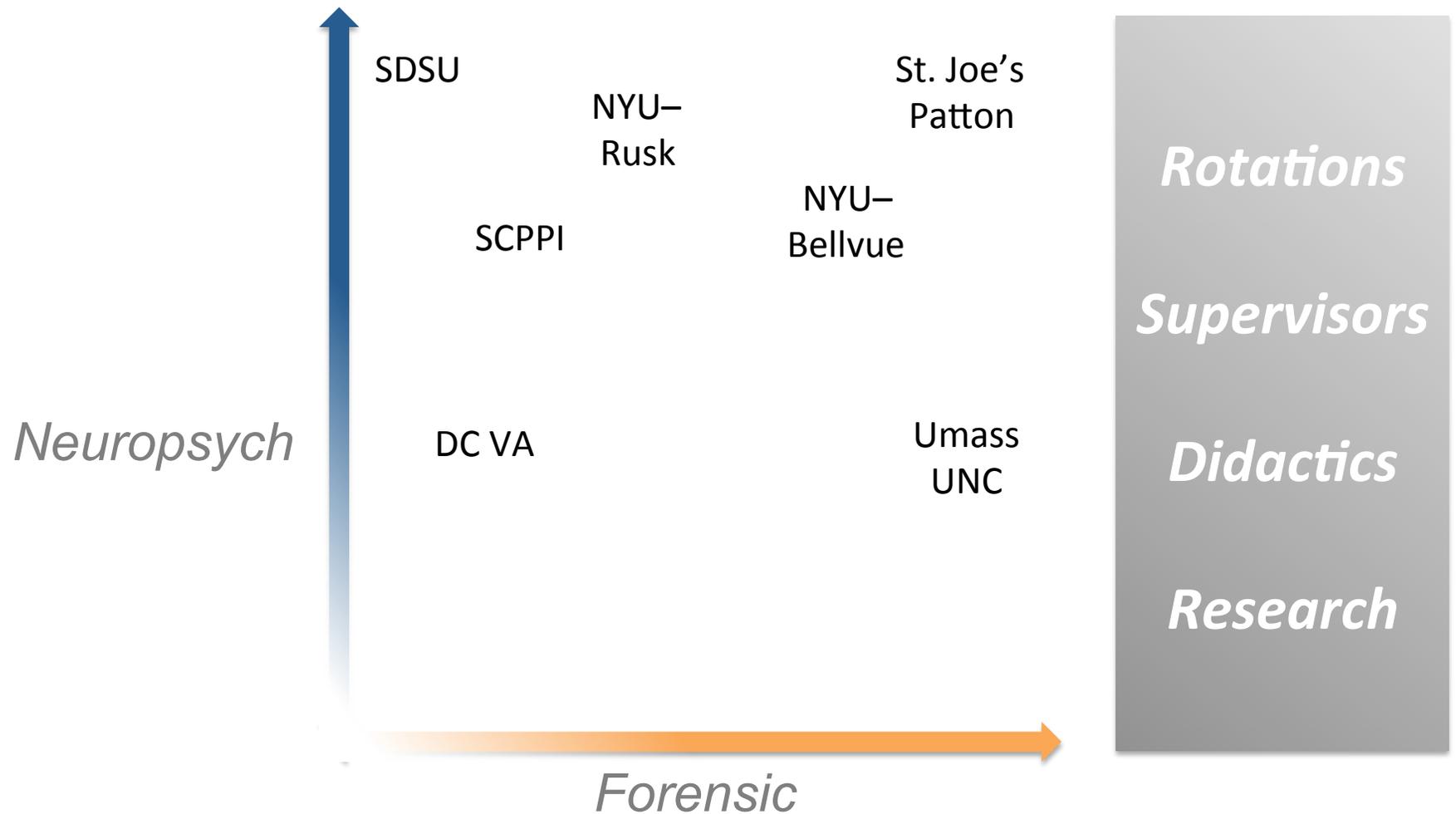
Biological aspects of behavior



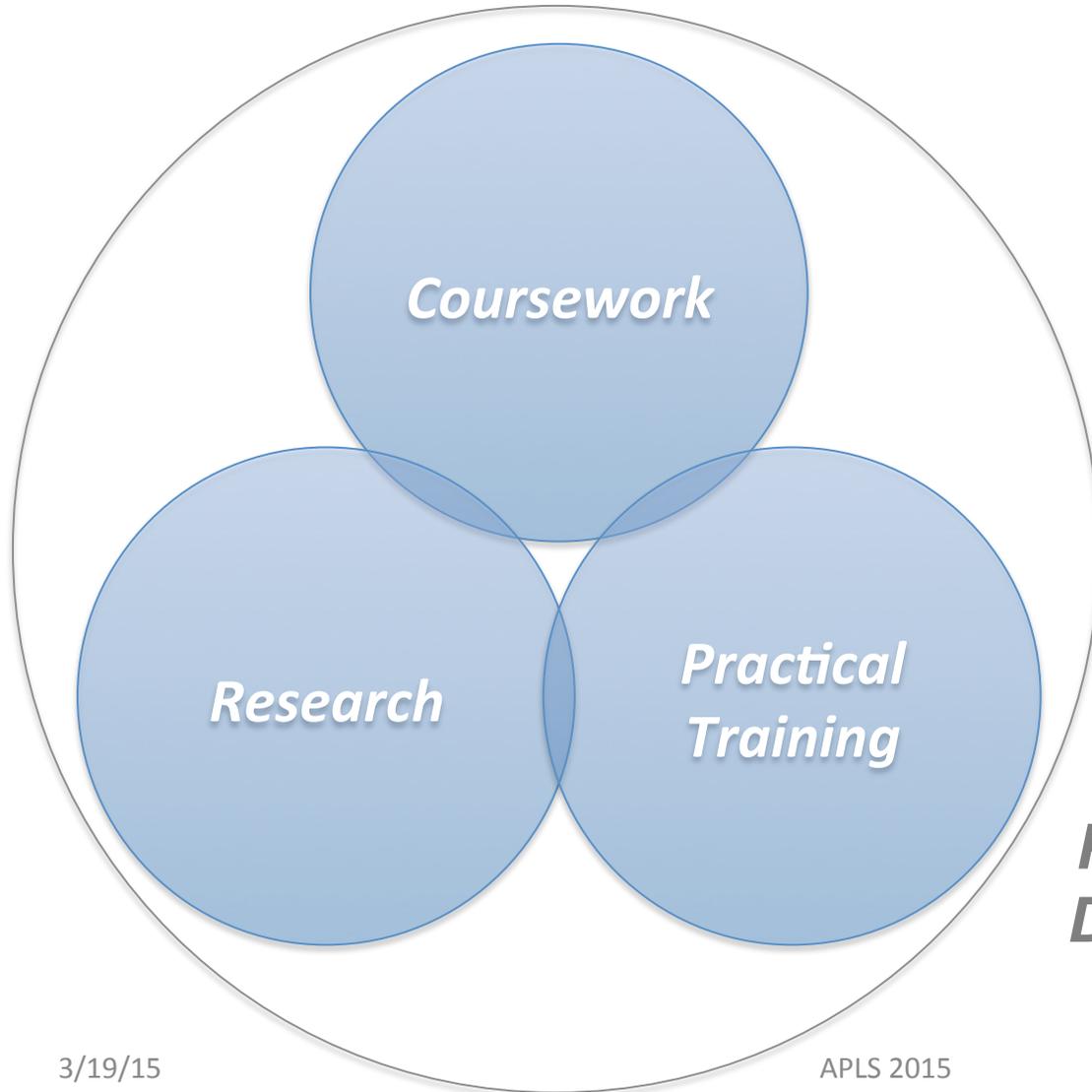
Graduate training



Predoctoral internship

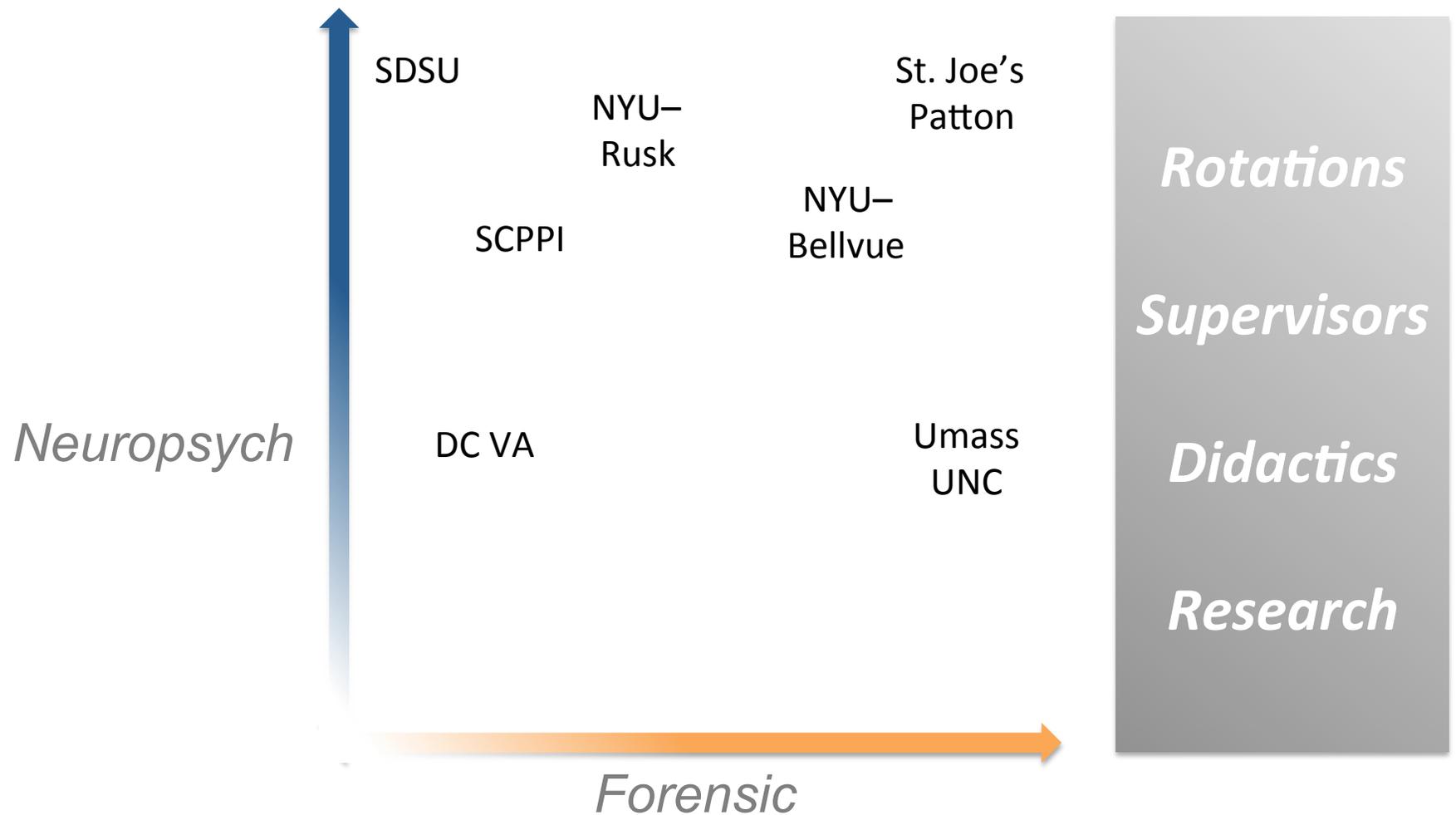


Case Example: Graduate training



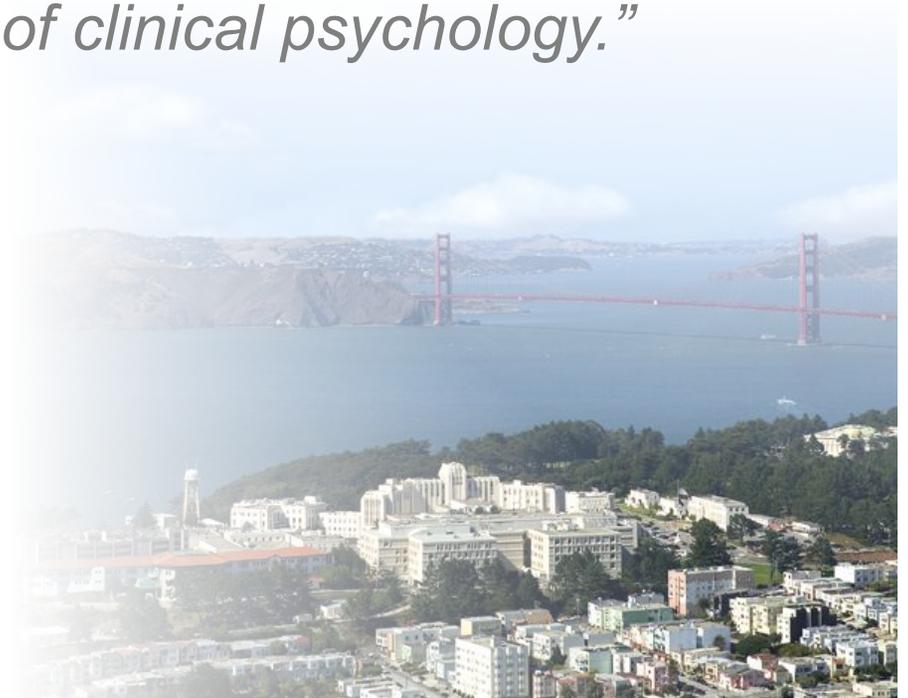
***Professional
Development***

Case Example: Predoctoral internship



San Francisco VAMC Predoctoral Internship

“Neuropsychology is a field that is strongly tied to the rapid advances in clinical neuroscience that are altering our perspective on a range of issues related to the practice of clinical psychology.”



Opportunities for Advanced Clinical and Research Training in Forensic and Neuropsychology



STEPHANIE BROOKS HOLLIDAY, PHD

My Path to Forensic Psychology



- Interested in forensic psychology
 - Undergraduate research assistant with Dr. Eric Elbogen at Duke University
- Planned to apply to graduate school, but wanted to gain applied experience with a forensic population first
 - Post-bacc internship at Montgomery County, MD, Pre-Release and Reentry Services

My Path to Forensic Psychology



- Applying to graduate school
 - Seeking a forensic concentration
 - Research interests included risk assessment and correctional treatment
- Completed doctoral training with Dr. Kirk Heilbrun at Drexel University
 - Forensic research
 - Practicum experiences
 - ✦ Correctional treatment
 - ✦ Forensic assessment
 - ✦ Health psychology
 - ✦ VA medical center – psychosocial rehabilitation for veterans with serious mental illness

My First Introduction to Neuropsychology



- **Sought generalist internship**
 - But still planning for a forensic postdoc
- **Clinical internship at the Washington DC VA Medical Center**
 - Neuropsychology rotation...
 - Became 1.5 neuropsychology rotations...
 - Became 1.75 neuropsychology rotations.
 - Outpatient neuropsychological evaluations through general clinic
 - Inpatient brief evaluations and evaluations for capacity
 - Outpatient evaluations through Polytrauma clinic

My Introduction to Neuropsychology, cont.



- **Began to have informal conversations with supervisors**
 - Opened my mind to an entire area of psychology that was previously unfamiliar
- **Delved into the literature**
 - Forensic literature often had little mention of cognitive factors
 - Neuropsychological literature often had little mention of psychosocial factors
 - Saw this as an opportunity for research

Selecting a Path for Postdoctoral Training



- In selecting programs, I considered...
 - Forensic focus
 - Interested in weaving in my experience in neuropsychology
- Neuropsychology postdoctoral fellow at the War Related Illness and Injury Study Center
 - 50% clinical
 - 50% research related to issues of postdeployment health
 - Willing to support me in pursuing my own research interests

Current Postdoctoral Work



- Examining the combined impact of traditional forensic risk factors and neuropsychological factors in the prediction of future offending behavior among justice-involved veterans
 - LS/CMI
 - Measures of executive functioning
 - Veteran-specific factors?
- Clinically
 - Comprehensive and brief neuropsychological evaluations
 - Health psychology components

Combining Forensic and Neuropsych – Clinical Opportunities

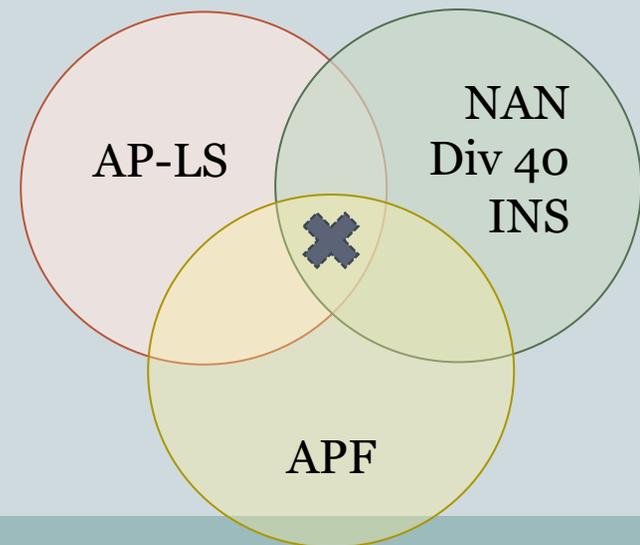


- **Integrating neuropsych into forensic**
 - Neuropsychology as a component of civil and forensic evaluations
 - Being uniquely positioned to integrate both forensic and neuropsychological data
 - Understanding the clinical needs of forensic populations
- **Integrating forensic into neuropsych**
 - Approach to testing and report writing

Combining Forensic and Neuropsych – Research Opportunities



- We're only just scratching the surface of forensic neuropsych research
 - Opportunities to examine the way that these disciplines inform each other, beyond just the use of neuropsych measures in a forensic setting/population
- Additional funding opportunities
 - As a brief example...
 - ✦ AP-LS
 - ✦ NAN
 - ✦ Division 40
 - ✦ INS
 - ✦ APF



Challenges



- Be prepared to serve as an ambassador for the other field
 - Both in terms of clinical and research practice!

Moving Forward



- **Completing my neuropsych fellowship**
 - Despite some challenges in the initial implementation of fellowship project, this has provided useful information for future study design
- **Future career directions**
 - Clinically, this opens up many opportunities
 - Research-wise, this training has opened up a completely new field, and with it a broader set of ideas

Lost in Translation: Finding *A Path as a Psycho-Legal Psychologist*

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Center for Law, Brain and Behavior
Massachusetts General Hospital



Overview

- Translational research
- Neuroscience: The holy grail?
- My rocky, winding path
- Some resources



Translational Research

- Is it just basic to applied?

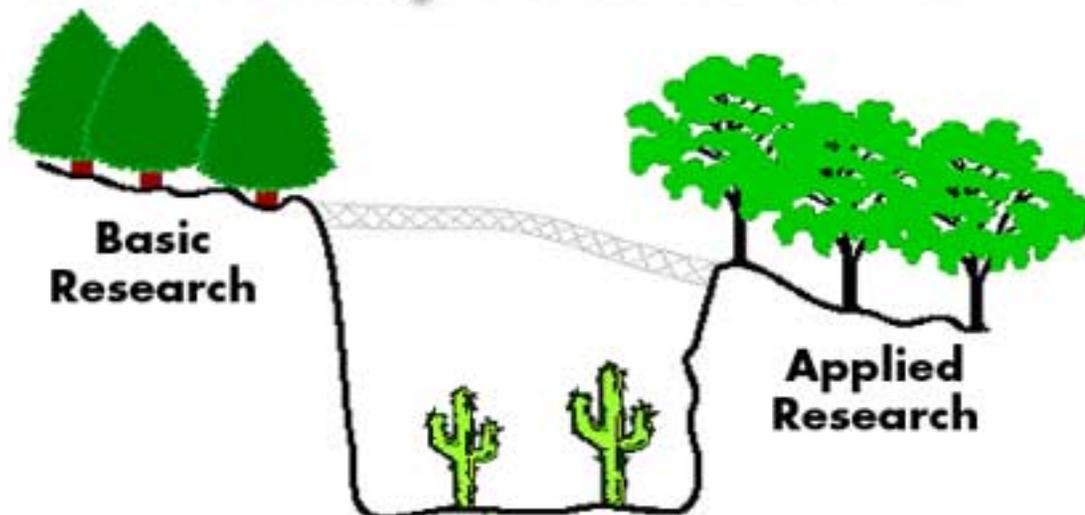


"Sure, we can spend all day nitpicking specifics but aren't sweeping generalities so much more satisfying?"

Funding

- Basic → at least 60% of NIH budget
- Clinical/Applied → > 30% (includes animal work)

The Valley of Death ...



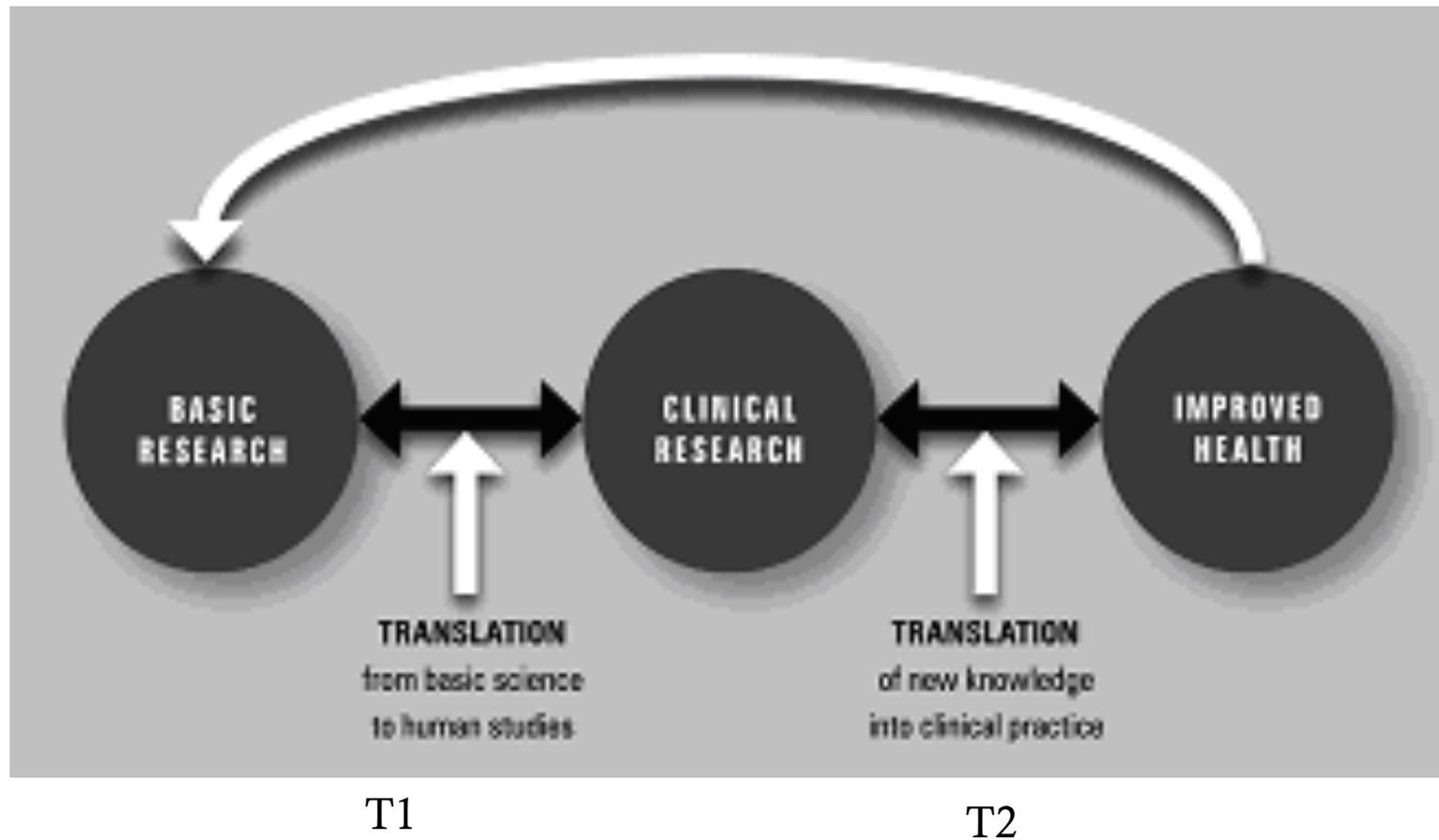
"Valley of Death"

www.atp.nist.gov

Closing the Valley

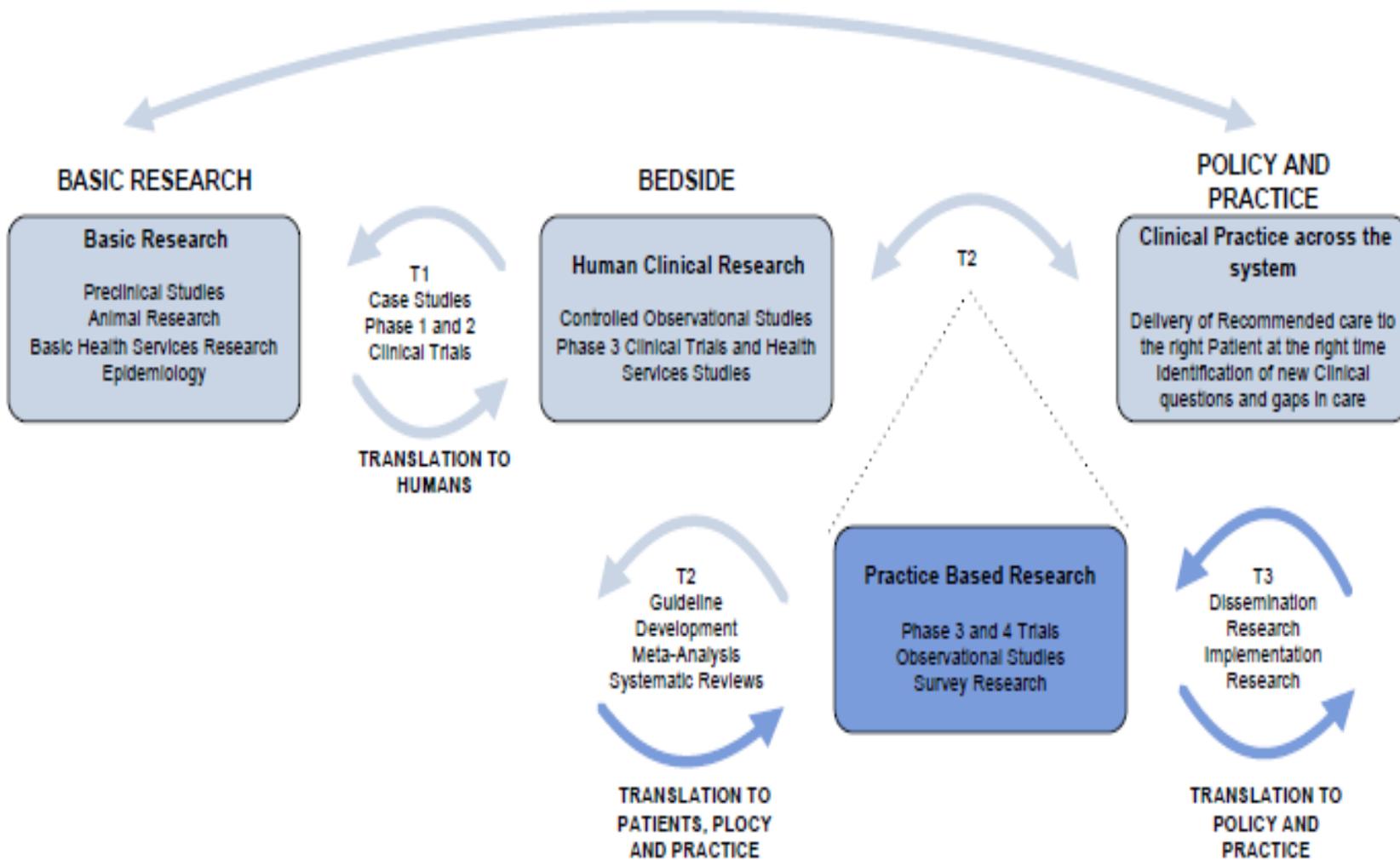
- By merging fields and and calling for faster application or **translation**
- 1st reference to **translation** in PubMed in 1993 in response to BRCA1/cancer genes and call for **immediate application in early detection**
- “Translational research means different things to different people, but it seems important to almost everyone”(Woolf, 2008)

Translational Research Schematic

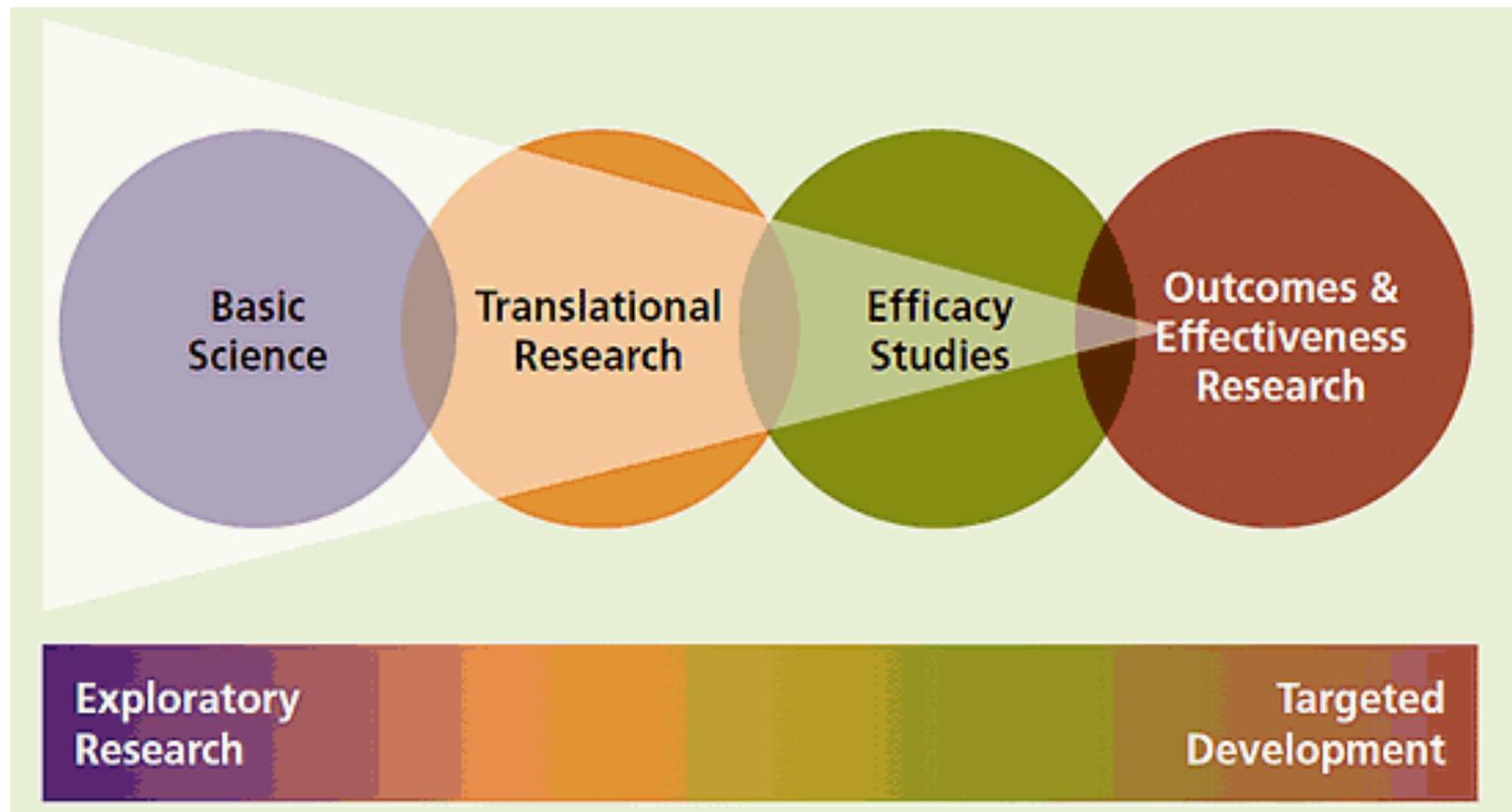


Definitions

- “Bench-to-Bedside”
- T1 “transfer of new understanding of **disease mechanisms** gained in the laboratory **into development of new methods** for diagnosis, therapy, and prevention and their first testing in humans”
- T2 “translation of **results from clinical studies** into **everyday clinical practice** and health decision-making”



Psychology in Translational Research



Psychology in Translational Research

- T2 but possibly T3 and T4
- Is it different when dealing with disciplines outside medicine? (e.g., law, finance, economics)
- Translating can happen at different levels (e.g., to affected communities, to public at large, decision-makers, policy)

Neuroscience: The Holy Grail

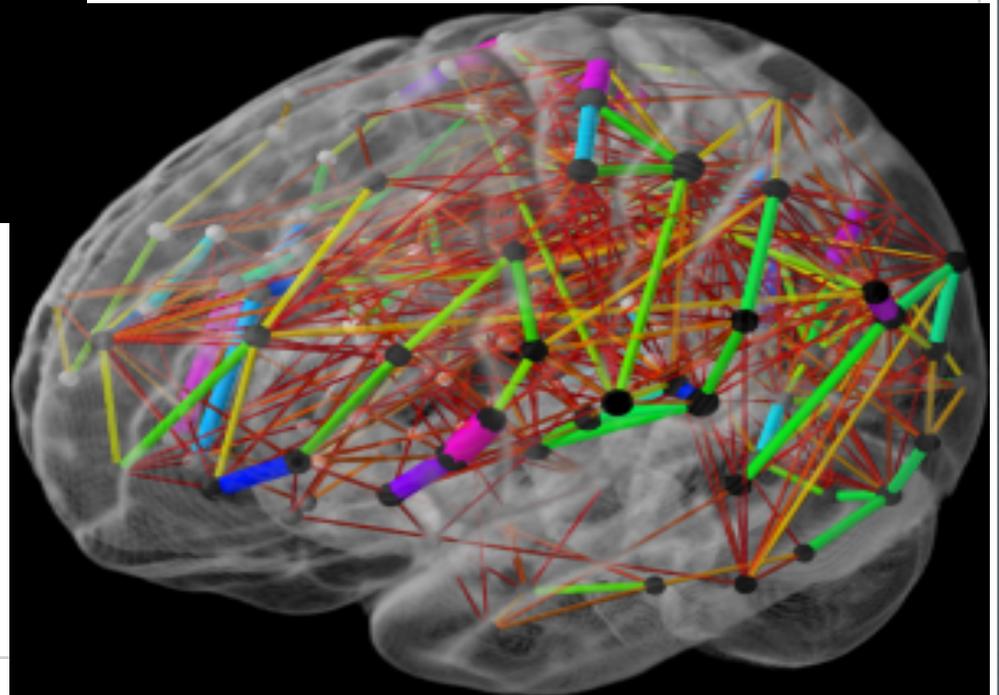
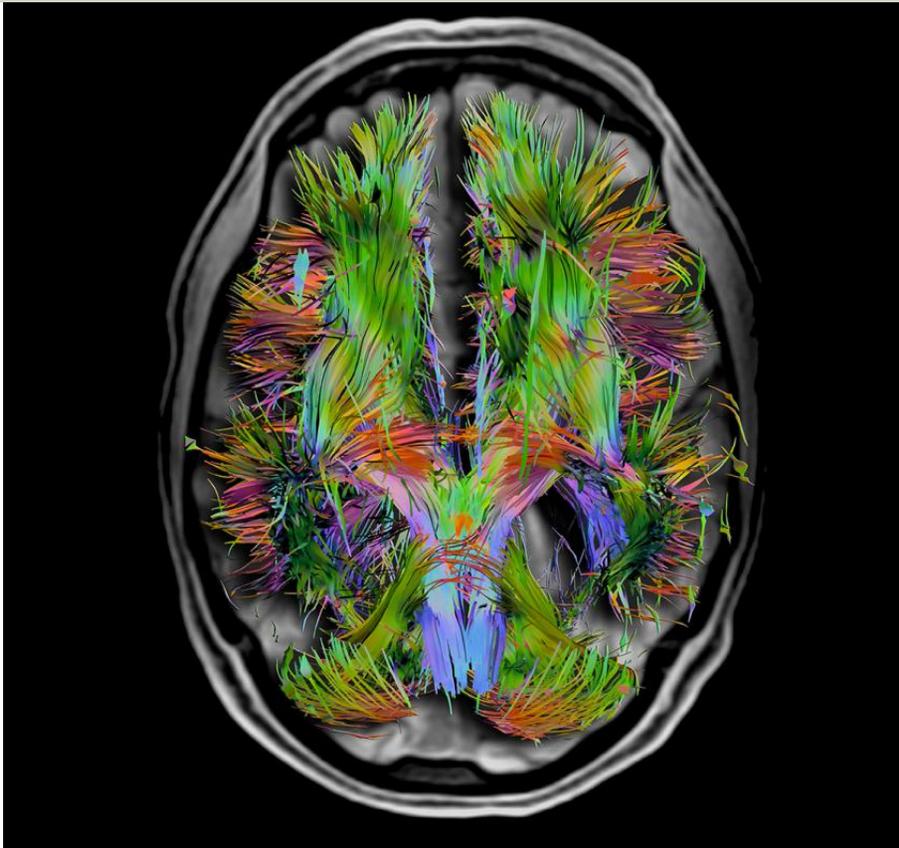


Neuroscience Funding

- NIH funding FY2011 - **\$5.55 billion** for 16,472 grants (sfn.org)
- *BRAIN* initiative
 - \$100 mil in FY 2013
 - \$4.5 bil for next 12 years (\$300 - \$500 mil/year; nih.org)
- NSF funding on *Understanding the Brain* - FY2014 \$92 mil (nsf.org)
- Private foundations:
 - Dana Foundation
 - Wellcome Trust

Rise of Neuroscience

- Unprecedented technological advances in the past three decades
 - fMRI, PET, SPECT, DTI
 - Connectivity
- Observing the working brain
- Leading to faster and more effective translation?



Example of Neuroscience in Translational Context

- Deception
 - Basic processes of deception (localization, connectivity)
 - Accuracy rates of detection using imaging
 - Application to real life settings
 - Feasibility of admission in court, etc

My rocky, winding path



Lessons Learned

- Holy grail (or trail) is not for everyone
- Patience, creativity and open-mindedness help a lot
- Right type of mentorship is essential
- Understanding where on the translational continuum you want to be will structure your path

Some Resources

- Society for Neuroscience
 - www.sfn.org
- MacArthur Research Network on Law and Neuroscience
 - www.lawneuro.org
- MGH Center for Law, Brain and Behavior
 - www.clbb.org
- UPenn Center for Neuroscience & Society
 - <http://neuroethics.upenn.edu>
- Baylor Initiative on Neuroscience and Law
 - <http://neulaw.org>

Thank You!



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What Criminal Justice Needs from Neuroscience and Why It is (Usually) Unlikely to Get It

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Vanderbilt University

Types of Defenses

- At trial—Possible defenses include:
 - Involuntary act
 - Lack of mens rea
 - Insanity—mental disease plus:
 - Cognitive impairment (e.g., M’Naghten):
 - Volitional impairment (e.g., irresistible impulse)
- At sentencing—Mitigation:
 - Non-capital (FSG § 5K2.13): Only if non-violent crime and actor was “significantly impaired” in ability to control
 - Capital: Virtually always relevant, but beware the double-edged sword
- Bottom line: Neuroscience rarely useful on liability

Five Types of Neuroscience Evidence

- Almost useless: Evidence of scans showing FLD, fMRI patterns
 - Doesn't show causation (cf. Ort case)
 - In any event, causation is not excuse (cf. Morse)
- Also almost useless: Evidence about the cause of an effect (e.g., how many violent people have FLD?).
 - Bryant study of 110 inmates: Those who committed violent crimes were 2 ½ times more likely (73%/28%) to have FLD than a nonviolent offender!!!
 - But so what?
- Somewhat useful: Prevalence data about the effect of a cause (e.g., how many people with FLD are violent?).
 - Some estimate that the violence prevalence rate among those with FLD is 10-20% higher than for non-FLD people!!
 - But base rate violence of non-FLD people is only 2%
 - Further: what is definition of FLD? Violence?

Five Types of Neuroscience Evidence, Continued

- Useful, but very hard (as of now) to get: Individualized evidence of low self-control (e.g. Results on Go-No Go, Stop-Signal, Card Sorting or Reversal Learning tasks) that provide measures of impulsivity against a baseline
 - Malingering highly possible
 - Baselines for relevant demographic groups very hard to establish
 - Legal cut-offs not clear (lowest 1%, 5%?)
- Useful, and more likely to get: compare defendant's scan or fMRI data to average scan or fMRI data of group known to be entitled to mitigation (e.g., juveniles, people with intellectual disability)
 - Malingering difficult and baselines easier to establish
 - Cut-offs established by U.S. Supreme Court (*Roper, Atkins*)
 - Invoke concept of “scientific stare decisis”. Cf. *Sears* (2010) (“regardless of the cause of his brain damage he was among the most impaired individuals in the population”).

What Neuroscience Can Offer in Other Criminal Justice Contexts

- Competence to proceed
 - Can assist in detecting malingering by comparing brain structure/function of defendant with people known to have low IQ
- Dangerousness
 - Can identify correlations between brain structure/function and people known to be high risk
- Treatment efficacy
 - Can measure changes in brain structure/function pre-post treatment
 - Can compare treated population to untreated matched population known to be low risk

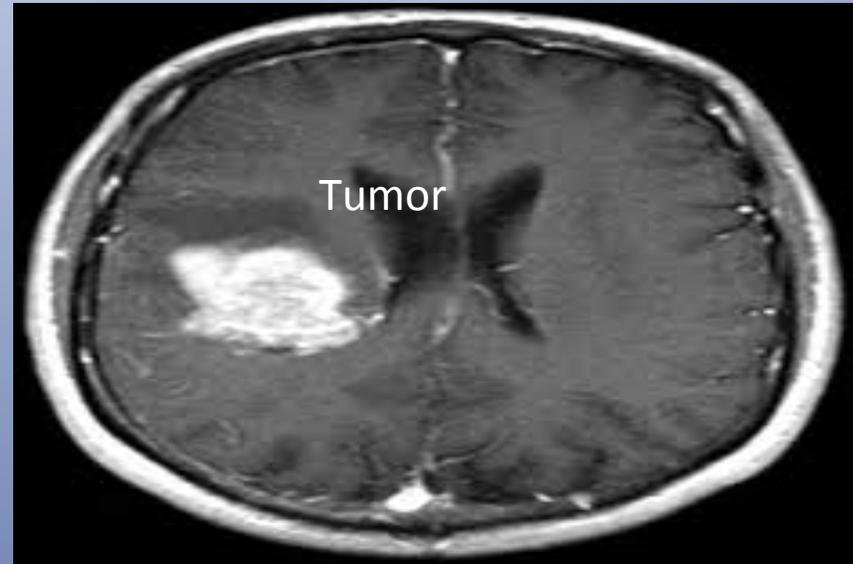
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Daubert-Type Cautions

- Testing procedures & error rates
 - Brain scans: How was lobe damage measured? When was lobe damage measured?
 - fMRI: How was neuronal activity measured?
 - Were confidence intervals, effect sizes calculated?
- Standards, peer review, and general acceptance
 - Were scans and fMRIs conducted according to standard and accepted practices?
 - Were error rates calculated in accepted ways?

- Brain Scan (MRI)



- Brain Imaging (fMRI)

