Behavioral Pharmacology Research: Past and Future

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Behavioral Pharmacology Incorporates both Behavior and Pharmacology

- Pharmacology and Neurosciences
  - Receptor theory
  - Molecular biology and genetics
  - Neuroimaging
- Behavioral Sciences
  - Learning theory
  - Ethology
  - Behavioral economics
  - Decision theory

Early Advances in Behavioral Pharmacology Research

- Development and refinement of animal models of addiction
  - Models had both face validity (Subjective effects and drug taking) and heuristic utility
  - Models based on well-developed learning theories and behavioral analysis
  - A true transdiscipline: Developed by both behavioral scientists and pharmacologists, enriching their individual conceptions of the problem, leading to a new beast – a behavioral pharmacologist

Animal Models: Early Impact

- Reconceptualization of substance abuse as a learned misbehavior amenable to direct scientific study
- Demonstrated the importance of context in determining drug effects
- Helped transition portions of the field (i.e. CPDD) from studies of physical dependence to broader approaches
- Provided powerful tools for the practical problem of abuse potential assessment of new medications

Impact of Animal Behavioral Pharmacology on Human Research

- Seemless transition from animal to human laboratory models
- Provides ability to test mechanisms (and proof of concept) for new treatments under controlled conditions prior to clinical trials
- Provides vehicle (not fully realized as yet) to incorporate cognitive neuroscience into drug abuse research

Impact

- Drug effects are fast moving events with dynamic changes on a minute by minute (second by second) basis
- We understand some of these dynamics as they relate to propensity for faster onset, etc.
- Upside: May be able to arrange medication formulations to reduce abuse
- Tobacco industry has applied these principles to cigarette technology

Future Challenges for Behavioral Pharmacology Research

- Retaining focus on context in the face of the neuroscience onslaught
- Distinguishing drug use and abuse, having models for SUD’s
- Greater focus on acquisition and cessation
- Lack of advances in experimental design
- Need for use of multivariate approaches

Future Challenges for Behavioral Pharmacology Research

- Need to focus on individual differences
- Need more developmental research
- Complex studies not easily used for the large sample sizes needed for genetic research

Shifting Sands: Examples of New Drug Problems in my Scientific Lifetime

- Crack cocaine
- Designer hallucinogens (e.g. MDMA)
- PCP/ketamine
- GHB

Potential New Problems

- Potent opioids
- Additional drug use by inhalation route
- PREPs

Some Additional Names to Acknowledge

- Joe Brady (channeling BF Skinner and early experimental psychology)
- Peter Dews, Roger Kelleher and Bill Morse
- John Falk
- Jerry Jaffe
- **Bob Schuster, Bob Harris and Lou Harris**
- **Chicago Peer Group: Marian Fischman, Chris Johanson, Linda Dykstra, Klaus Miczek**
- **Dick Clayton and TERN**