Human Emotion

Emotion in Animals
Can animals have feelings like us?
Roadmap

Course Logistics

Why Study Animals?

Premises & Methods

Monkey See, Monkey Feel?

Canine Compassion & Rodent Rapture?

Take-Away Qs & Expert Interview
“Obviously, the true objection to anthropomorphism is not to discovering a similarity of mechanism in human and animal behavior, but to inventing similarities that do not exist.”

(Hebb, 1946, p. 88)
Comparative Study of Emotion

Definition
Research methodology that aims to make comparisons across different species, with specific focus on emotions.
Why Study Animals?
Why Study Animals?

Reason 1

Trace potential origins of human emotions

- Comparative analysis of human and non-human behavior
- Trace evolutionary origin of uniquely human feelings

de Waal (2005)
Why Study Animals?

Reason 2

Learn the minimum requirements for experiencing an emotion

- complex language?
- socialization of emotion?
Why Study Animals?
Reason 3

Cross-species comparison

- What emotions are unique to humans? (cross-species differences)
- What emotions are shared across species? (cross-species similarities)

Bard et al., 2004; Parr, Winslow, Hopkins, & de Waal, 2000; Panksepp, 1998
Why Study Animals?
Reason 4

Understand social environment and behavior

Humans co-evolved with animal species, such as the dog
Dogs had to develop human-compatible emotional skills
Dog behavior can be used to understand human behaviors

Bard et al., 2004; Parr, Winslow, Hopkins, & de Waal, 2000; Panksepp, 1998
Why Study Animals?

Reason 5

Animal models of emotional disorders

Identify neural circuits related to give rise to emotional difficulties (i.e., rat studies)

Example: violence, anxiety, depression

Bard et al., 2004; Parr, Winslow, Hopkins, & de Waal, 2000; Panksepp, 1998
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Basic Premises

1. Evolutionarily (aka ‘phylogenetically’) related species share similar neural bases for emotion.

- e.g., human and chimpanzee brains are organized similarly
Basic Premises

2. Emotional expressions are similar between closely related species.

- Chimpanzee Silent-Bared Teeth Display (SBT) = human smiling?

- Chimpanzee relaxed-open-mouth (ROM) = human laughter?
Methods

Early Anecdotal Method
Methods
Experimental Laboratory Studies

[Diagram showing a laboratory setup with a rat, loudspeaker, lights, response lever, food dispenser, and electrified grid]

[Historical black and white photograph of a crowd]
Methods

Field Studies
- Observational
Methods
Field Studies
- Experimental
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Take-Away Qs & Expert Interview
Emotion Expression
Emotional Expressions

Bard et al., 1992; 1998; 2000; 2005
Emotional Expressions Smiling
Emotional Expressions Crying

Bard, 2000; 2005
Emotional Expressions: Surprise & Anger

**Surprise**
- Monkey expression
- Human face
- Chimpanzee expression
- Child face

**Anger**
- Elephant expression
- Human face
- Monkey expression
- Child face

Emotional Expressions

Dr. Lisa Parr
Emory University

Dr. Kim Bard
University of Portsmouth
Facial Action Coding System (FACS)

Developed Ekman & Friesen 1970’s
Categorize facial behaviors based on muscles that produce them
Unit of measurement = Action Unit (AU’s)
Specific AU combinations reflect emotions
Takes 80-100 hours to train on
Emotional Expressions Chimp (FACS)

Vick et al., 2007; Waller et al., 2006
www.chimpfacs.com
Compared facial musculature

Arrive at ChimpFACS
www.chimpfacs.com

Vick et al., 2007; Waller et al, 2006
www.chimpfacs.com

FRONTALIS (1,2)
CORRUGATOR SUPERCILLI
DEPRESSOR SUPERCILLI
PROCERUS
ORBICULARIS OCULI
LEVATOR LABII SUPERIORIS SALAEQUE NAS
LEVATOR LABII SUPERIORIS NASALIS
ZYGOMATIC MAJOR
ORBICULARIS ORIS
CANINUS
BUCCINATOR
TRIANGULARIS
DEPRESSOR LABII
MENTALIS
PLATYSMA
FREQUENCY OF DISPLAYS IN DIFFERENT CONTEXTS
(Mean + SE)

- AGG
- AFF
- PLAY
- OTHER

Waller & Dunbar, 2005
Emotional Expressions Complex

Emotional Expressions Complex

Bard, Gasper, & Vick (2010)
“Like human smiling, there may be meaningful variations in bared-teeth displays”

(van Hooff, 1973)
Emotional Expressions

Can only be properly understood when:

- Careful objective coding of facial expressions are used (e.g., ChimpFACS)
- Focus on underlying emotion signaled by facial expression
- Consider context in which expression is being used to communicate message
Silent-Bared Teeth Display (SBT)

Smiling

Scream

Similar, but not Identical

Relaxed Open Mouth (ROM)

Laughter

Parr et al., 2007
Emotion Experience
Complex Emotions Empathy

**Empathy**
- Ability to put yourself in another individual’s shoes.
- Need a “theory of mind” or ability to mentalize others internal emotions.

**Frans de Waal**
- Empathy in all species who live in groups (Preson & de Waal, 2002).
- Necessary for: (1) Group alarm and (2) Mother-infant relationship
Caveats

Careful not to anthropomorphize
  ascribe human qualities to non-human entities

Lack of confirmatory self-report data

Behavioral similarity does not =
  same psychological experience of emotion
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Canine Compassion Tail Wag

Asymmetric Tail Wag
- 30 dogs placed in cage with camera
- View (1) owner, (2) unfamiliar human, (3) cats, and (4) unfamiliar dominant dog

Left Tail Bias (RH = negative emotion):
  Unfamiliar dominant dog

Right Tail Bias (LH = positive emotion):
  Owners, unfamiliar humans, cats
Canine Compassion Guilt
Do dogs really feel guilty?

- 14 dogs videotaped repeatedly
- Coded for “guilty look” presence when disobeying owner’s command (not eat treat while owner was away) and varied whether owner’s knew of dogs behavior.
- No evidence of guilty look.
- Guilty look found more often when owners scolded dogs.
- Suggests guilt may be response to owner cues rather than appreciation of misdeed.

Horowitz, 2009
What Are Animals Thinking?
Probe animal morality, the "swarm intelligence" of a beehive, the amazing navigation talents of pigeons, and more. Aired November 7, 2012 on PBS.

http://www.pbs.org/wgbh/nova/nature/what-animals-thinking.html
Canine Compassion   Empathy

Dogs can read our feelings
- 18 pet dogs
- 4 separate 20-second encounters with humans (owners and strangers)
- Humans either hummed, talked, or cried
- Dogs most often comforted person by nuzzling and licking when human was crying

Custance et al. (2012)
Animal cognition

Man’s best friend

Can dogs really show empathy towards humans?

Jun 30th 2012 | from the print edition

Dogs quickly become part of the family. Tales abound of dogs celebrating joy in a household or commiserating when tragedy strikes. This may not seem surprising after 15,000 years of co-evolution. But what hard evidence is there of dogs’ empathy with humans? A new experiment suggests that behind all the waggy tails there really is something deeper going on.

Past experiments have hinted that animals can feel sympathy. Rats and monkeys had been found to forgo food to avoid delivering electric shocks to relatives. Similarly, apes have recently been documented consoling one another after conflicts. However, all these experiments and observations were demonstrating an animal’s sensitivity to distress in other members of the same species. Deborah Custance and Jennifer Mayer of Goldsmiths College, London, set out to see if dogs could detect the emotional state of humans.
“I think there is good reason to suspect dogs would be more sensitive to human emotion than other species”

- Deborah Custance
Rodent Rapture
Laughter: Uniquely human?

- Originally thought that capacity for human laughter preceded capacity for speech and language in evolution of human brain.

- However, neural circuits for laughter exist in more primitive brain regions that date long ago in other animals before humans came along.
Laughter in Rats

Jaak Panksepp (2005)

- Rats 50 Hz “chirp” during play and when playfully tickled.
- Rats also seek out tickling (sign of pleasure).
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Take-Away Qs & Expert Interview
Experts In Emotion

*EXTRA CREDIT OPPORTUNITY*
Experts In Emotion Interview

Dr. Lisa Parr
Assistant Professor
Division of Psychiatry and Behavioral Sciences
Yerkes National Primate Research Center
Emory University

Emotion expression & recognition in chimpanzees
Experts In Emotion Interview

Dr. Jaak Panksepp

Baily Endowed Chair of Animal Well-Being Science
College of Veterinary Medicine
Washington State University

Emeritus Professor
Department of Psychology
Bowling State University

Animal models of human brains
Thank You!

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