

COGS 1: Spring 2019

Section E, Week 6

| | | | |
|------------------------|---|------------------------|----------|
| Professor Boyle | <u>mboyle@ucsd.edu</u> | Friday, 2-4 pm | CSB 130 |
| Lauren | <u>lcurley@ucsd.edu</u> | Tuesday, 10-11 am | CSB 225 |
| Lexi D. | <u>adalenco@ucsd.edu</u> | Tuesday, 12:30-1:45 pm | The Loft |
| Elena | <u>edreisba@ucsd.edu</u> | Thursday, 1-2 pm | CSB 114 |
| Adrian | <u>ajm033@ucsd.edu</u> | Wednesday, 5-6 pm | CSB 114 |
| Audrey | <u>aberardi@ucsd.edu</u> | Tuesday, 4-5 pm | CSB 114 |
| Devansh | <u>d4agarwa@ucsd.edu</u> | Monday, 4-5 pm | CSB 114 |
| Lori | <u>rol044@ucsd.edu</u> | Monday, 10-11 am | CSB 114 |
| Lexi F. | <u>adfrankl@ucsd.edu</u> | Thursday, 4-5 pm | CSB 114 |

Important Information

- **Midterm 1**

- Grades have been released
- Contact your TA if you don't see a grade

- **Midterm 2**

- On Tuesday, May 21 during lecture of Week 8
- Covers all material from Weeks 4 – 6

- **EC Reading Quiz**

- Based on reading for Dr. Bergen's lecture: "What Profanity Teaches Us"
- Available on TritonEd from Wednesday, May 8 @ 4pm – Thursday, May 9 @ 10:00 am

Last Week's Topics

- Lecture 9 | Dr. Deak: How Do We Become Socially Skilled?

Lecture 9 | Review Questions (1 of 3)

Vote!!

1. What are some reasons for cognitive scientists to study development?
2. What are some general types of social skills shared by humans and animals?
3. What is kin recognition?
 - a. Is it unique to humans? Why is it important?
 - b. What is the evidence that infants discriminate biological motion? What method was used?
 - c. How does facial recognition and facial processing develop during infancy?

Lecture 9 | Review Questions (2 of 3)

Vote!!

4. What type of neural system regulates infant-parent interaction?
 - a. What neuromodulators are involved in social reward?
 - b. What are some major functions of DA and Oxytocin, and how do they interact?

5. How do infants and adults establish “common ground” in communication?
 - a. What is attention-sharing? What forms does it take?
 - b. Is this skill unique to humans?
 - c. How can attention sharing help infants learn language? (What did Baldwin’s study show?)

Reading | Review Questions (3 of 3)

Vote!!

6. Understand the traditional view on how babies think.
7. What knowledge (physics etc.) do babies have? What is the evidence?
8. Define “statistical patterns” with examples. How do babies apply statistics? Why are they like “scientists”?
9. Where can probabilistic models be applied?
10. Why is the immaturity of human babies important?
11. Compare the brain of children and the brain of adults.

1. What are some reasons for cognitive scientists to study development?

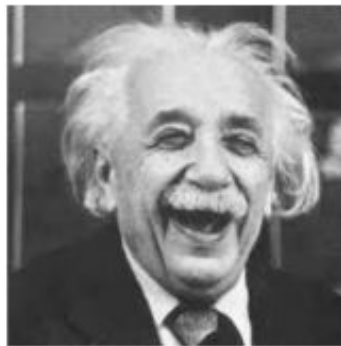
Practical Reasons

- Treatment of individuals
- Improve education/parenting
- Help children at risk

Theoretical Reasons

- Understand traits through its emergence

All Ques.



The rest of the psychological and behavioral sciences are algebra

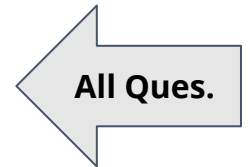
The study of development is calculus

– Albert Einstein

2. What are some general types of social skills shared by humans and animals?

Diverse, Multivariate Skills in Vertebrates

- Kin Recognition
- Parenting
- Communicating
- Hunting/Playing
- Mating
- Aggression/Dominance



3a. What is kin recognition? Is it unique to humans? Why is it important?

Importance of Kin Recognition

- Essential for survival

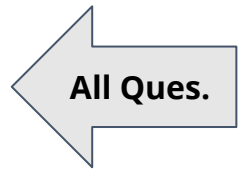
Evolutionary importance: don't want to misdirect maternal care (high cost, little to no benefit)

- Need to establish:

Who's my caregiver?

- NOT unique to humans

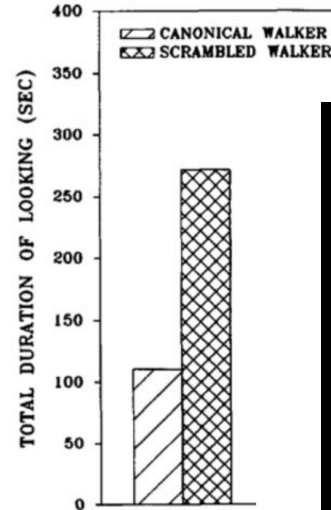
Occurs in plants & animals



3b. What is the evidence that infants discriminate biological motion? What method was used?

Point Light Display Study

- Carried out by Bertenthal et al. (1987)
- 3-month-olds' discrimination of biological motion → walking patterns
- Habituation and dishabituation using canonical vs. scrambled walker

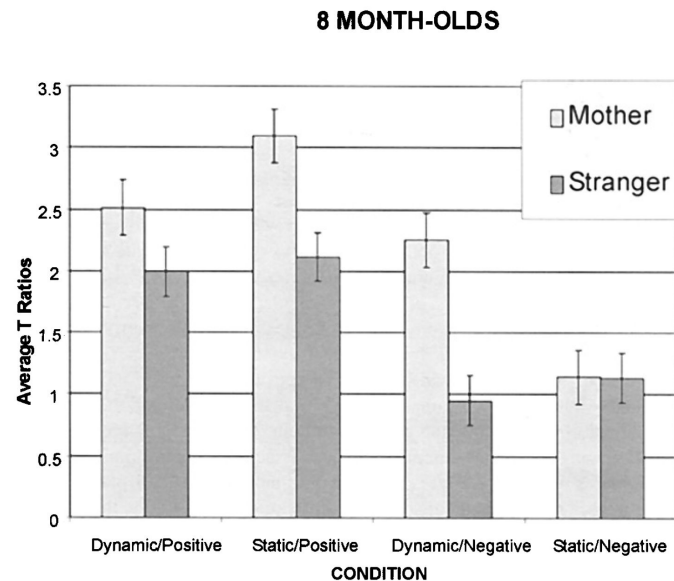


All Ques.

3c. How does facial recognition and facial processing develop during infancy?

Facial Recognition Begins Early

- Start responding to face-like shapes → <1 week
- Smile at people → 3 months
- Stranger anxiety, preferential affection to parents → 7-9 months
- Experiment by Layton & Rochat, 2007:
Habituate to stranger #1; then
Dishabituate to stranger #2 or mother

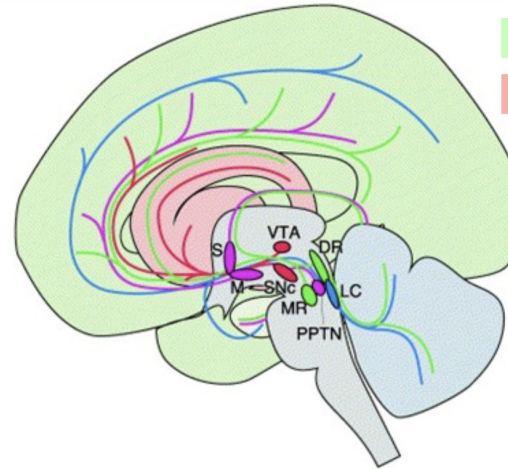


All Ques.

4a. What type of neural system regulates infant-parent interaction? What neuromodulators are involved in social reward?

Neuromodulatory Regulation

- **Examples of Neuromodulators:**
 - Dopamine (DA)
 - Norepinephrine (NE)
 - Serotonin (5-HT)
 - Acetylcholine (ACh)
- **Neuropeptides / hormones:**
 - Oxytocin
 - Endogenous opiates, androgens



Glutamate producing neurons

GABA producing neurons

Neuromodulatory neurons and their axonal projections:

Norepinephrine

Dopamine

Serotonin

Acetylcholine

All Ques.

4b. What are some major functions of DA & oxytocin, and how do they interact?

Neural Correlates of Parent-Infant Interaction

Interaction of oxytocin & dopaminergic system \Rightarrow motivation to seek social contact

Dopamine (DA):

Involved in motivation / reward

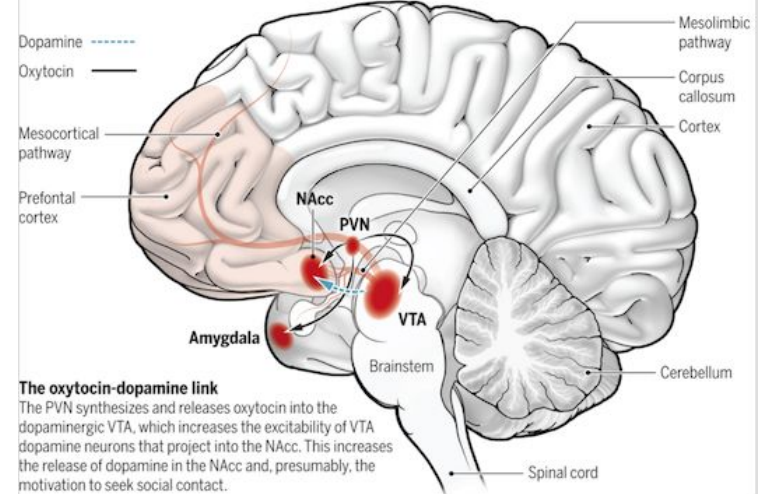
Oxytocin:

Facilitates childbirth-related processes, promotes social behavior

All Ques.

How social processes become rewarding

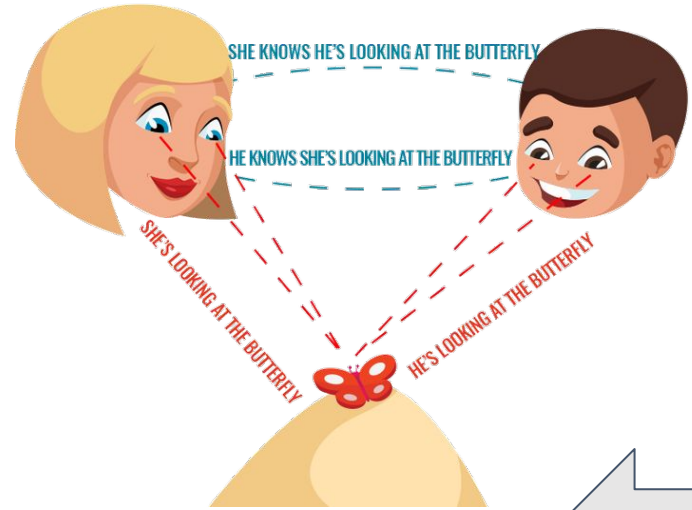
Studies in mice suggest that social behavior in humans occurs because of the connections between oxytocin and the reward-based dopaminergic system, which presumably mediates the ability of humans to notice, seek, remember, and return to rewarding experiences of all types—in this case social contact.



5a. How do infants and adults establish “common ground” in communication? What is attention-sharing? What forms does it take?

Matching One's Focus with Another Person's

- Look where someone is looking
- Get someone to look where you're looking
- Important for teaching & learning

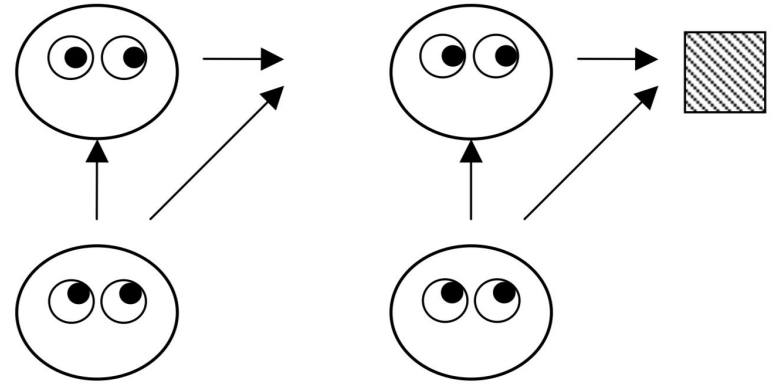


All Ques.

5b. Is the skill (joint attention) unique to humans?

Social Gaze in Non-Human Primates

- Evidence for gaze following
 - Found in primates e.g. macaques, chimpanzees, etc.
- Joint attention can also be observed these species.



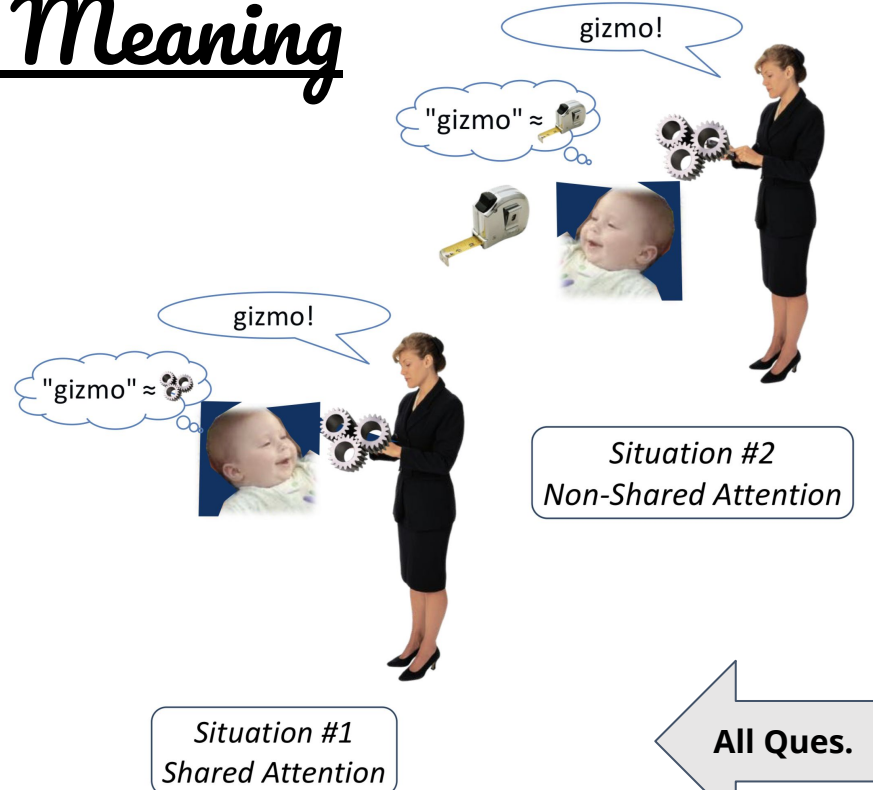
1. Gaze Following vs. 2. Joint Attention



5c. How can attention sharing help infants learn language (What did Baldwin's study show?)

Language Through Shared Meaning

- Figure out *what's important* to other people and what they mean
- Watch and learn from skilled conspecifics
- 18-month-olds associate word with object only in *shared* attention context (Baldwin, 1991, 1993)



6. Understand the traditional view on how babies think.

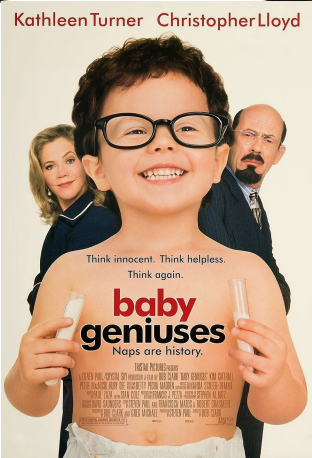
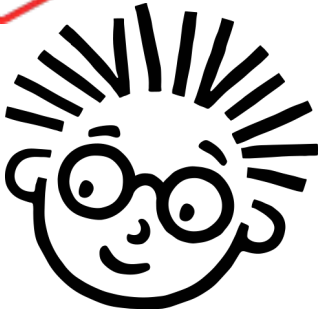
Traditional Viewpoint:

Babies / young children are **irrational, egocentric & amoral.**

Even the youngest children know, experience and learn far more than scientists ever thought possible

MYTHS

BUSTED



7. What knowledge (physics etc.) do babies have? What is the evidence?

Physics

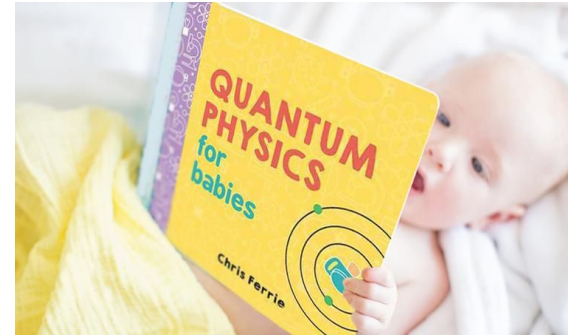
- Trajectories, gravity and containment

Biology

- Growth, inheritance and illness

Psychology of Others

- Theory of Mind



All Ques.

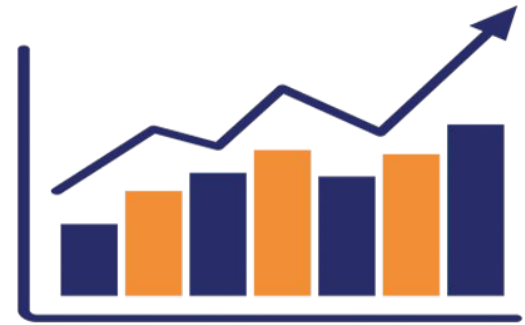
8. Define “statistical patterns” with examples. How do babies apply statistics? Why are they like “scientists”?

Statistical pattern ⇒ in developmental context: **identifying regularities vs. discrepancies in the environment**

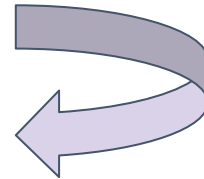
- Draw conclusions about the world

Example from your reading:

- **Grammatical patterns**
 - Study by Saffran, Aslin & Newport (1996)
 - Play syllable sequence, some are more likely to follow than others (e.g. “ro” follows “bi” $\frac{1}{3}$ of time, while “da” always follows “bi”)



Babies listened longer to the statistically improbable syllable strings!

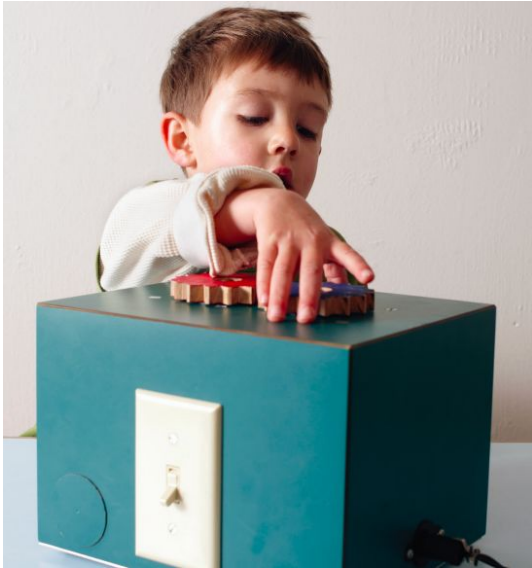


All Ques.

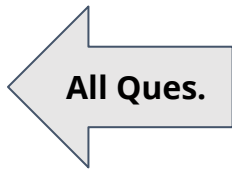
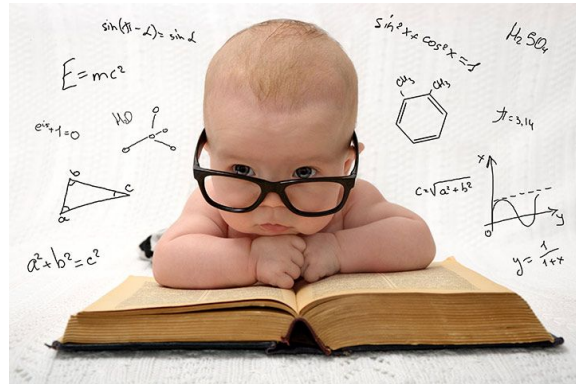
8. Define “statistical patterns” with examples. How do babies apply statistics? Why are they like “scientists”?

Baby Scientists

THE BLICKET DETECTOR

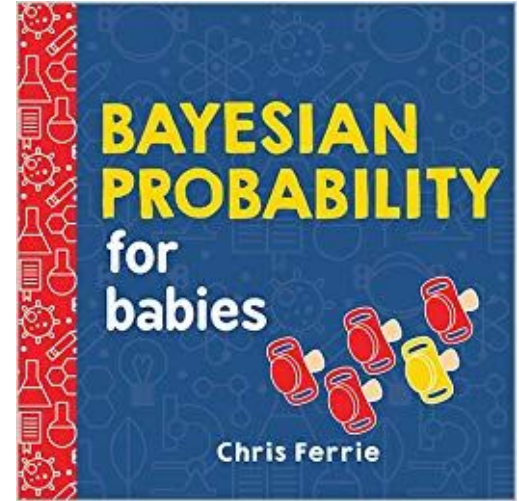


Young children can utilize **statistical probabilities** to figure out how the machine works (i.e. which objects make the novel apparatus light up)



9. Where can probabilistic models be applied?

- Use math to describe the hypotheses that children might have about things
- Systematically relate the hypotheses to the probability of different patterns of events.
- When children use Bayesian statistical analysis
 - Better than adults on unusual possibilities
 - Instruction → less creativity



Babies look longer at novel or unexpected events than at more predictable ones, and experimenters can use this behavior to figure out what babies expect to happen.

All Ques.

10. Why is the immaturity of human babies important?

Precocial vs. Altricial

- **Precocial** ⇒ rely on innate capacities, mature quickly (in some species, immediately after birth)
- **Altricial** ⇒ offspring require extensive care & parental investment (e.g. humans)



“Fundamentally, babies are designed to learn”

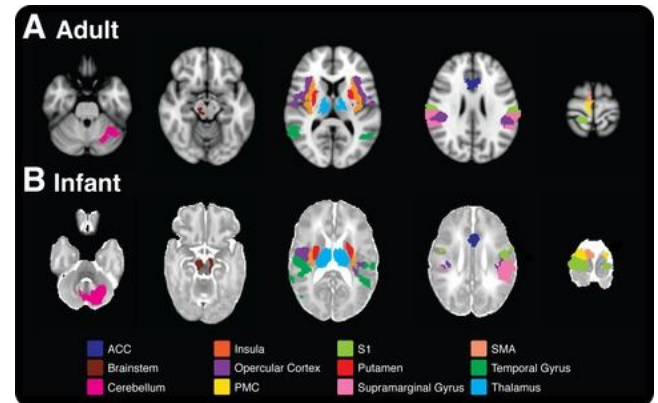
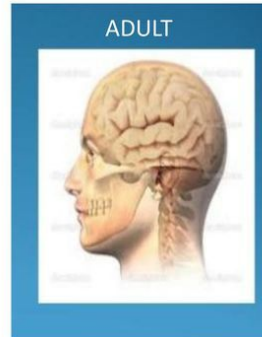
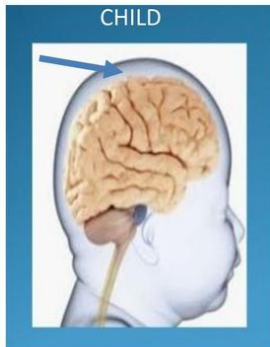
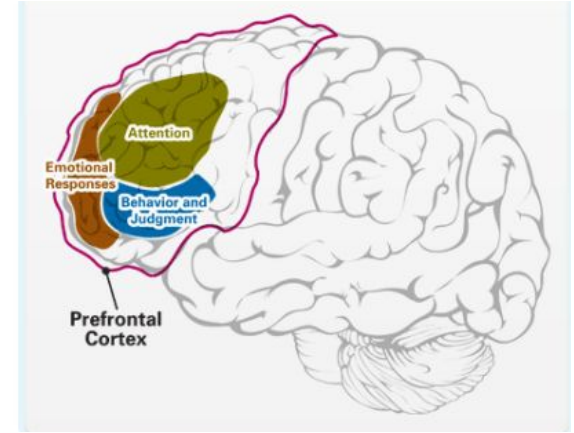
Correlation between **intelligence & flexibility** and **immaturity of babies** across animal kingdom



11. Compare the brain of children and the brain of adults.

Babies' vs. Adults' Brains:

- Brains of babies are more plastic
- More connections between neurons
- High level of chemicals → easy change
- Lack of prefrontal-control



All Ques.

Quiz Time!

- No talking, signaling, or communicating of any kind.
- Put away your books, notes, computers, phones, etc.
- Pen or pencil is okay (just make sure it's a black pen and you press hard with a pencil).
- Write your name in the "Name" box, write and circle in your PID, and sign the academic integrity agreement.
- Bubble in this section
- Please have your student ID out when you turn in your quiz!

Write and circle
in your PID

Write down your name here

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| STUDENT PID NUMBER | | | | | | | | | |
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| COURSE NUMBER | | | | | | | |
| COGS 1 | | | | | | | |
| SPRING 2019 | | | | | | | |
| Dr. Mary ET Boyle | | | | | | | |
| Quiz A | | | | | | | |
| April 9-12, 2019 | | | | | | | |
| Quiz VERSION | | | | | | | |
| A | B | C | D | E | F | G | H |
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| Section you are taking this quiz: |
|-----------------------------------|
| Please Bubble only one! |

- [1] ① Monday @ 9 Lexi D.
- [2] ② Monday @ 4 Elena
- [3] ③ Wednesday @ 2 Adrian
- [4] ④ Wednesday @ 3 Audrey
- [5] ⑤ Wednesday @ 5 Devansh
- [6] ⑥ Friday @ 11 Lori
- [7] ⑦ Friday @ 12 Elena
- [8] ⑧ Friday @ 1 Lexi F.

Bubble in the
current section

Quiz will not be graded without
Academic Integrity Signature.

| ACADEMIC INTEGRITY |
|---|
| By taking this quiz, you agree that you will follow ALL UCSD ACADEMIC INTEGRITY policies. It is YOUR responsibility to know and understand all of the policies. Failure to follow all UCSD Academic Integrity policies could result in expulsion from UCSD. |
| DO NOT DISCUSS THIS QUIZ CONTENTS WITH FELLOW STUDENTS!!! |
| _____ Signature |
| _____ Date |
| Your signature above certifies that you <i>will follow</i> and that you know that you will suffer the consequence for ANY academic integrity violation. |

Sign and
date here



| YOUR ANSWERS GO HERE | | | | | |
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| | [A] | [B] | [C] | [D] | [E] |

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Bubble in the
answers