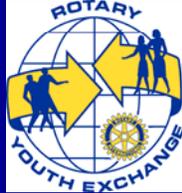


Innies and Outies



For Some of You Joining Us, English is not Your First Language

Preview of things to come: Listening to a presentation in a language that is not your first language is similar to what it is like to be an introvert.

What are you?



An Experiment

An Introvert and Extrovert on the Subway



- 75% of US citizens are extroverts.
- The percentage of US exchange students who are extroverts is probably even higher.
- The percentage of extroverts is lower among Asians.

Being an Extrovert or Introvert

- Is a type of temperament.
- It is biological, so it is not something you can significantly change.
- The major distinction is whether you are energized by:
 - Internal world of ideas, emotions, & impressions.
 - External world of activities, people, places, and things.

In other words, what recharges your batteries?



←Extroverts—need to be out and about to refuel

Introverts → need to stop spending energy and rest to recharge



Key Differences

- Energy creation (external v. internal)
- Response to stimulation
 - Extroverts: Quick reaction
 - Introverts: Slow reflection
- Depth versus breadth
 - Extroverts: Breadth (they know something about everything)
 - Introverts: Depth

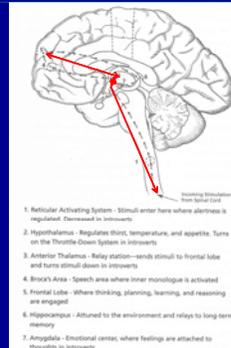
INTROVERTS

hold a moment while I'm processing

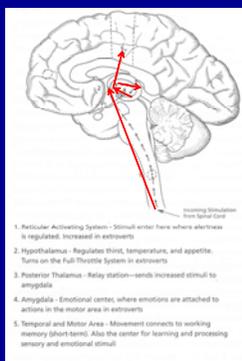
Biological Basis

- Chemicals called neurotransmitters allow our brain cells to talk with each other.
- **Reward chemical (Dopamine)**--Controls reward and pleasure centers. Extroverts rely on the shorter dopamine pathway.
- Learning, memory, and mood chemical (**Acetylcholine**)--Affects learning, memory, and mood. Introverts rely on the longer acetylcholine pathway.

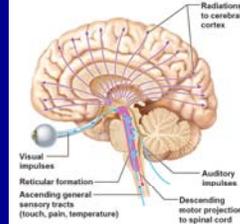
Longer Introvert Acetylcholine Pathway



Shorter Extrovert Dopamine Pathway



The Reticular Formation



Ascending reticular activating system controls amount of sensory input into the brain.

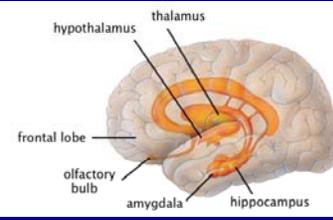
- Introverts—system is wide open making them sensitive to stimulation and prone to over arousal; therefore, they avoid stimulation.
- Extroverts—system is tighter making them relatively insensitive to stimulation and prone to under arousal; therefore, they crave stimulation.

Incidentally the reticular activating system is the part of the brain stem that gets damaged in PTSD as a result of over stimulation.

Hypothalamus: regulates thirst, temperature, and appetite. It turns on the:

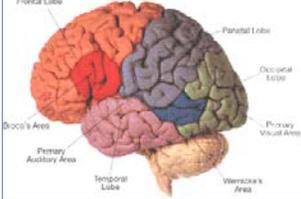
- Parasympathetic (throttle-down energy conserving) nervous system in introverts; or
- Sympathetic (full-throttle, energy expending) nervous system in extroverts;

Broca's area: the speech area where inner dialogue is initiated in introverts. This area is not reached by the Dopamine Pathway that dominates in extroverts.

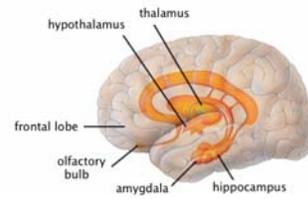


Thalamus: relay station

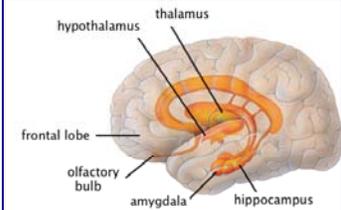
- *Anterior thalamus* sends stimuli to the frontal lobe and turns down stimuli in introverts.
- *Posterior thalamus* sends increased stimuli to the amygdala in extroverts.



Frontal lobe: Where thinking, planning, and learning are engaged in introverts. This area is not reached by the Dopamine pathway that dominates in extroverts.

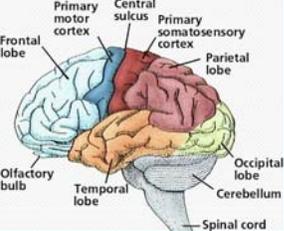


Hippocampus: Attuned to the environment (including opinions of others) and relays information to long term memory in introverts. This area is not reached by the Dopamine pathway that dominates in extroverts.



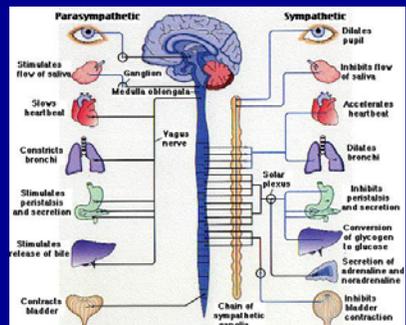
Amygdala: emotional center of the brain. This is where emotions attach to:

- Thoughts in introverts, which is one reason they prefer the inner world of thoughts
- Actions in the motor area in extroverts, which is one reason they prefer action.



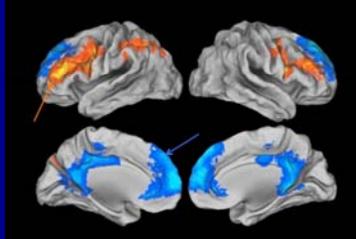
Temporal and Motor Area: Where movement connects to working or short-term memory. It also serves as the center for learning and processing sensory and emotional stimuli. Stimuli reaches this area in extroverts but not in the Acetylcholine Pathway dominant in introverts.

Stress sets our dominant nervous system into motion: Introverts: Throttle Down Extroverts: Full Throttle



Parasympathetic	Sympathetic
Stimulates flow of saliva	Inhibits flow of saliva
Slows heartbeat	Accelerates heartbeat
Constricts bronchi	Dilates bronchi
Stimulates peristalsis and secretion	Inhibits peristalsis and secretion
Stimulates release of bile	Conversion of glycogen to glucose
Contracts bladder	Secretion of adrenaline and noradrenaline
	Inhibits bladder contraction

How do we know about these pathways and systems.



Functional MRI allows us to visualize the brains pathways when we stimulate the brain. The patterns for introverts differ from those of extroverts.

Introversion Trait Overlaps with a Person's Emotional Style

What is meant by Emotional Style?

- A consistent way of responding to the experiences of our lives.
- It is governed by specific, identifiable brain circuits that can be measured using objective laboratory methods.

Six Identified Emotional Styles

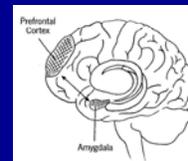
- **Resilience.** How slowly or quickly a person recovers from adversity.
- **Outlook.** How long a person is able to *sustain* positive emotion.
- **Social Intuition.** How adept a person is at picking up social signals from others.
- **Self-Awareness.** How well a person perceives bodily feelings that reflect emotions.
- **Sensitivity to Context.** How good a person is at regulating emotional responses to take into account the context the person finds himself or herself in.
- **Attention.** How sharp or clear a person's focus is.

Resilience

- Some evidence that a student's resilience is the most reliable predictor of whether the student will be an early return.
- The 14-Item Resilience Scale™ (RS-14)
- Adolescence Resilience Test

Biological Basis of Resilience

Signals between the Prefrontal Cortex and Amygdala determine how quickly the person recovers from an upsetting experience.



More Evidence for Biological Basis of Introversion and Extroversion

An Experiment--Infants are exposed to set of new experiences such as voices, balloons popping, colorful mobiles, and scents

- One group--lustily pumped arms & legs and had elevations in heart rate, blood pressure, and finger temperature
- Second group—quiet & placid
- Third group—in between
- Which group was the introverts? Why?

Jerome Kagan Experiment with High and Low Reactive Infants

- Infants exposed to set of new experiences such as voices, balloons popping, colorful mobiles, and scents:
 - High reactive (20%): lustily pumped arms & legs and had elevations in heart rate, blood pressure, and finger temperature
 - Low reactive (40%): quiet and placid
 - In between (40%)

High Reactives = Introverts

- Have excitable amygdala.
- More aware and alert.
- Biological markers include higher heart rates, wider dilation of eyes, tighter vocal cords, and more cortisol (stress hormone) in saliva.
- Pattern does not change when they become adults. They are more sensitive to photos of unfamiliar faces than low reactives.
- Do not seek danger.

Some Physical Traits—High Reactives are more likely to have

- Blue eyes
- Allergies
- Hay fever
- Rigid torso
- High rate of perspiration

Genetic Basis

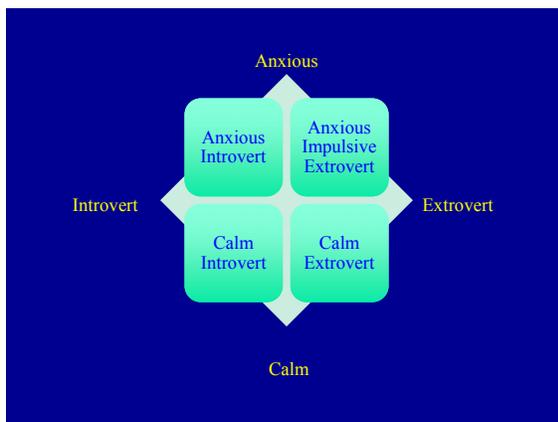
- Serotonin-transporter (SERT) gene or 5 HTTLR helps regulate processing of serotonin, a neurotransmitter that affects mood. A short variation of this gene is associated with introversion.
- D4DR gene affects Dopamine, controls excitement levels, and is vital for physical activity and motivation. A short variation of the gene is highly sensitive to Dopamine and is associated with risk-taking extroverts.

More Biological Evidence

- Over 100 species share the distinction between introverts and extroverts.
- Introverts are more sensitive to sensory stimuli such as lemon juice.

Introversion \neq Shyness

- **Introversion** is a means of attuning to your inner world. Immsies have social skills. They like people and enjoy some socializing--one on one is most important while larger groups are draining.
- **Shyness** is about social anxiety and a lack of confidence in social settings.



Introversion is associated with shyness

- 25% of introverts suffer from social anxiety disorder.
- Incidence of social anxiety disorder may be as high as 20%.
- Incidence of social anxiety disorder is much lower in extroverts.

Special Considerations for Introverts

Trait of Introversion or Extroversion is different from the Trait of Openness to New Experiences

Geography and Introversion

- Introversion is relatively more common in Asia and Africa.
- Extroversion is more common in Europe and the United States.
- Good data does not appear to be available for Latin America.

Finland—an exception

- How do you know whether a Finn likes you?
- He's staring at your shoes instead of his own.

Some Careers Associated with Introverts

- Musician
- Writer
- Artist
- Actors and Comedians
- Scientist
- Mathematician or actuary
- Computer scientist
- CEOs of companies that are well managed

Famous Introverts

- Moses (as opposed to Aaron)
- Warren Buffet
- Rosa Parks
- Gandhi
- Albert Einstein
- Bill Gates
- Abraham Lincoln
- Barack Obama

Is Extroversion/Introversion Trait Entirely Biological?

- A person can change the way brain circuits operate by choosing different life experiences and by training the brain.
- Genetics sets the range of what is possible.
- Life experiences determine whether we are closer to one end or the other end of what is possible.

Pseudo Extroverts

Introverts who decide to act like extroverts

- Pseudo Extroverts who are hardest to unmask are introverts who are good at self-monitoring (modifying their behavior to the social demands of the situation).
- Additionally an introvert needs to have a restorative niche to which she can retreat when she wants to return to her true self.
- Key is that the act must be for the sake of:
 - Work they consider important;
 - People they love; or
 - Something they value highly.

Pseudo-Introverts

(Extroverts who in some ways act like Introverts)

- Not a commonly used term.
- Extroverts who have trained themselves to listen carefully and observe social context intently before speaking.
- These folks have forced themselves to be more reflective and less spontaneous.
- Extroverts who don't suffer from foot-in-mouth disease.

Orchid Child Hypothesis



- Many children are like dandelions; they can thrive in about any environment.
- Some children, including many introverts are like orchids. They wilt easily, but under the right conditions grow strong and magnificent.
- Investing time & effort in these children is likely to make a difference.



Multi-tasking

- Multi-tasking actually involves switching back and forth between multiple tasks. Multi-tasking reduces productivity and increases mistakes by 50%.
- Extroverts are better at multi-tasking because they are better at handling information overload.
- Introverts who multi-task risk over arousal which interferes with attention and short-term memory.

Observing v. Participating

- Introverts often assume the observer role because their brains are well suited for this task.
- Participating requires processing a lot of short-term information without becoming distracted or overly stressed. Extroverts excel at sociability in part because they are good at handling competing demands on their attention.

How Many of You Have Problems Recognizing Faces?

- Why do you think you have problems?

Amygdala Size and Facial Recognition

- Persons with larger amygdala are better at name and facial recognition and tend to have larger circles of friends.
- Amygdala of extroverts are generally larger than those of introverts.
- This may explain why extroverts are better at facial recognition and have more friends
- Introverts particularly benefit from learning techniques for remembering names and faces.



“You can observe a lot just by watching” Yogi Bera

A few observations

- Extroverts want to start with small talk before moving to deeper talk; introverts need to connect deeply before they are comfortable with small talk.
- Because introverts are less influenced by Dopamine (the reward and pleasure chemical), they find it easier to delay gratification. They also are not likely to be risk takers.
- Introverts are prone to strong feelings of guilt and tend to project their own reactions onto others.

Introverts

- Energized by the inner world of ideas
- Recharge their batteries by avoiding stimuli & seeking quiet
- Have high levels of inner brain activity, so avoid external activity
- Prefer depth in knowledge and friendships

Extroverts

- Energized by external activity
- Recharge their batteries by seeking stimuli
- Seek high level of external activity
- Prefer breadth in knowledge and number of friends

Why is the distinction between introverts and extroverts important for youth exchange?

Why is the distinction important for youth exchange?

- Innies and outies get in trouble in different ways.
- They respond differently to stress.
- Staying by yourself in your room means different things for the two groups.
- Rotarians should help innies & outies in different ways.
- Strategies can help make youth exchange easier for innies. Innies who succeed in an exchange often develop deeper connections to their new friends in their host country .
- Outies should be taught the natural observation skills and sensitivity of innies.

Outbound Students

How Should the Distinction Between Introverts and Extroverts Affect the Way You Select Outbound Students?

What Factors Might be More Important than Introvert/Extrovert in Selecting Outbound Students?

How Should You Orient Outbound Introverts and Extroverts Differently?

Why Might You Want to Let Your Exchange Partners Know Which Students are Introverts and Which Students Are Extroverts?

In what ways should your support of Outbound Introverts and Outbound Extroverts Be Different During Their Exchanges?

In which countries do you think
Introverts are most likely to
encounter problems?

In which countries do you think
Extroverts are most likely to
encounter problems?

Inbound Students

Why Might It Be Important to
Know Which of Your Inbound
Students are Introverts and
Which are Extroverts?

How Can You Find Out Whether an
Inbound Student is an Introvert or
Extrovert?

Who Should Know Whether Your
Inbound Student is an Introvert or
Extrovert?

Is Youth Exchange Easier for Introverts or Extroverts?

Introverts

How Could Youth Exchange be Easier for Introverts?

- Introverts already live in a different culture—the culture of the extroverts. So they have had years of experience adapting to a different culture.
- Introverts tend to observe the social customs before speaking or acting like a native.
- More likely to intensely study the culture and language before they go.
- Comfortable in small social settings such as families.
- Only introverts who want new experiences are likely to apply.

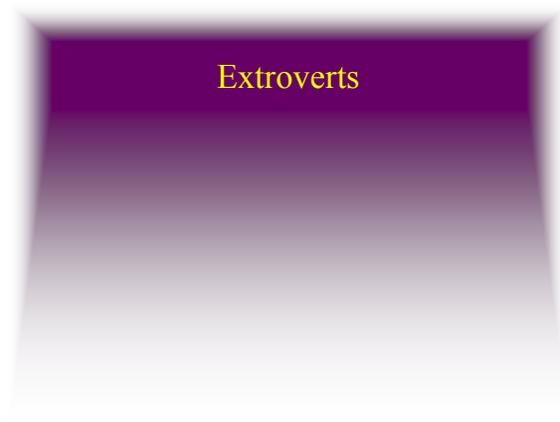
How Could Youth Exchange Be More Difficult for Introverts?

- More difficulty making friends.
- Preference for being alone versus interacting.
- Problems associating names with faces.
- Uncomfortable in large social settings.

What do introverted students most need to do to become at home in a strange land?

- Get out of their room to explore.
- Speak the native language.
- Initiate conversation.
- Let Rotarians and their host families know the places and things in their new country they are most interested in learning about.

In What Ways Might You Want to Turn Introverts into Pseudo-Extroverts?



How Could Youth Exchange Be Easier for Extroverts?

- Make friends easily.
- Thrive in large social settings.
- Most embrace new experiences.
- Have something to say on everything.
- Less likely to be upset by criticism.

How Could Youth Exchange Be More Difficult for Extroverts?

- More likely to take inappropriate risks.
- Difficulty in recognizing the social clues of a foreign culture.
- Tendency to make socially insensitive comments because they did not pick up on social clues.
- Emotionally more difficult to deal with lack of social interaction, which often results because of language issues.

Why do some extroverted exchange students remain strangers in a strange land?

- Extroverts normally speak quickly and off the cuff.
- When extroverts move to a foreign land, initially they are rarely able to respond quickly. By the time they process a sentence and have thought of something to say, the topic has moved on.
- They now face the same situation that introverts do in daily life in their native countries.
- When they do respond they are more prone to mistakes because they may not have observed long enough to understand the socially correct response.
- The Danger—Can extroverts cope emotionally with not getting to say what they want to say and with making socially incorrect responses?

In What Ways Might You Want to Turn Extroverts into Pseudo-Introverts?



Why do Introverts & Exchange Students Have Problems with Conversation?

- Extroverts are better at handling information overload because the reflectiveness of introverts uses up cognitive capacity. An introvert may have only 75% on task and 25% off task in reflecting, whereas an extrovert may have 90% on task.
- Exchange students face information overload from having to deal with the speed of processing a language that is not so familiar.

Resources

