Detecting deception

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Adjudicators of the law might question whether suspects, witnesses and/or victims are lying or accurately recalling the truth. While perceptional interpretations necessarily vary somewhat, there is only one truth that is reality. The brain is the cardinal transgressor in the commission of a crime, prescient to the realistic accounting of actions and observations.

At the neuroanatomical level of organization, telling a lie is different than recounting the truth. Merely relaying experienced events, even if the details are not wholly accurately remembered, whether emotively charged or not, largely recruits the hippocampus, the seahorse shaped region in the midbrain associated with memory. Conversely, deception is associated with activation of the frontal regions and the anterior cingulate cortex.

- *Where is that?* Neuroanatomy cliff notes: Your frontal region is behind and above your eyes. Deep in the evolutionarily ancient limbic system, the anterior cingulate cortex belongs to the reward/incentive circuit associated with assessing threat and emotional valence. For relevant context, thank your limbic system for the screaming thrill you get from amusement park rides (apart from throwing-up)!

Recounting the truth is relatively easy, largely devoid of neural activation. Just say what you saw, heard, smelled, tasted, felt or know, courtesy of the hippocampal 'black-box.'

- Factoid: witnesses naturally oftentimes err on the time of day/night or date, unless the select event coincides with an identifiable event: 'memory chunking.' That is, we remember events much better when marked by familiarity. Luckily, these exemplary witness accounts are time accurate:
    - Witness recalls when her/his sighting occurred, because it happened just minutes after s/he signed-out of their workplace early at 2 pm on this special day to celebrate their wedding anniversary.
    - Witness recalls hearing a gunshot outside when their favorite Friday night TV program started at 9 pm (verified by broadcast scheduling).

Fabricating an impromptu complex lie, even if delivered with skillful confidence, necessarily entails using the imaginative frontal cortices, which is a relatively circuitous neural pathway. Analogously, despite that you might be able to fry an egg, check the news and carry on a phone conversation all at once (sort-of, I guess), we generally do not multi-task very well. Such mental juggling is physiologically taxing as processing speed, accuracy and attentional focus necessarily plummet. While exceptions occur, the old adage that truth tellers can look you in the eye while liars cannot is spot-on. Poker players and actors *et al.* may be trained to control their responses in select situations. Otherwise, unless a lie is well rehearsed or ingrained, telltale signs of lying can be tricky to disguise. Recruiting frontal cortices during the commission of a lie can override physiological control of voice modulation and eye movements (known as saccades). These processes are exploited by truth verification technologies such as polygraph analysis, eye detect as well as the Reid Technique.

- Young children are notoriously bad at lying, for example, often looking away, fidgeting and stammering while categorically denying they stole that cookie. Childhood games such as 'hide and seek' and board games serve to refine concepts such as compartmentalizing our activities and strategically keeping secrets from others.

At risk of being a fortune cookie, I will advise: be wary of those who insouciantly lie, which may be an indicator of psychopathy in concert with other typifying traits. Those on the psychopathic spectrum lie convincingly without provocation, shift blame and deflect, all the while deftly defying standard levels of detection (e.g., Du Beau, 2018; Eagleman, 2011; Raine, 2013).

- Beyond the scope of this article, neural imaging evidence suggests that the gray to white matter volumetric ratio in the frontal cortices of the psychopathic brain are askew. This neuro-architectural property may allow psychopaths to lie with relative ease. Imagine this concept like ramping-up a circuit via a highly conductive metal or attenuating a radio signal by using an antenna. (e.g., Du Beau, 2018; Eagleman, 2011; Raine, 2013). But back to the story.

Oftentimes simply asking someone to recall an experience in a non-confrontational manner will jog their memory of events, eliciting further emergence of details. However, the truthful

recounting of observations and experiences never entails reinventing the whole story or fanciful embellishment.

Trust is an implicit expectation for most of us. Imagine anticipating travelling to a neighboring town tomorrow morning. You pack an umbrella based on information from your trusted college/friend in that town who relates that stormy dark clouds are forming. By default, we rely on others to help us construct our own reality, basing our decisions, innocuous or critical, on the experiences and observations relayed to us by others. Facing deception is always disillusioning and consequences may be dire. And investigative stakes can be steep. While there is no single sure-fire way to detect deception, logical deduction coupled with circumstantial awareness leads to discovering the truth.

REFERENCES

Du Beau A. (2018). Forensic neurobiology underlying violent criminal behavior. *Glasstree Academic Publishing*, Pgs. 1-35.

Eagleman D. (2011). Incognito: The secret lives of the brain. *Knopf Doubleday Publishing*.

Raine, A. (2013). The anatomy of violence: the biological roots of crime. *Random House, Inc*. Toronto, Canada.