Physiological Measures: Understanding Individuals within the Context of Family Relations

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Why add physiology measures?

• By understanding an individual’s physiological response to activities during family time, researchers are able to
  • identify potential biological correlates of divergent experiences during the same family activity
  • provide evidence-based research to inform family decision-making regarding shared family time to meet individual and family needs and cultivate healthy families.
Which physiology measures to add?

- Recent reports have added various physiological measures:
  - Genetic – Moore & Neiderhiser, 2014
  - Hormonal – Ha & Granger, 2016
  - Cardiovascular – Gottman & Gottman, 2017
- Oxytocin plays a key role in social and emotional behavior in both humans and animals, therefore, likely to enhance understanding of family relationships
How to add physiology measures

• Factors to consider. In what are you interested:
  • Predisposing or background parameters
    • Genetics
    • Arousal regulation measures
  • Physiological system reflecting process of interest
    • Stress – cardiovascular measures, stress hormones
    • Bonding – oxytocin
    • Pleasure – dopamine
  • Point vs. duration measurement
How to add physiology measures: Oxytocin

• Measuring naturally secreted oxytocin under conditions of interest
  • Peripheral vs central
  • Blood vs other bodily fluids

• Administering oxytocin to observe effect
  • Intranasal oxytocin activates brain centers associated with emotions and with bonding
Measuring oxytocin in the context of family activities

Illustration of a methodology
Measuring oxytocin during family activities

- Potential sources for measurement:
  - Cerebrospinal fluid (CFS)
  - Blood
  - Saliva
  - Urine

- Which to choose:
  - Invasiveness
  - Participant willingness
  - What the source measures
Measuring oxytocin during family activities

• What the source measures
  • CFS
    • activity in the brain
  • Blood
    • oxytocin secreted from pituitary
  • Saliva
    • oxytocin in the blood
    • reflecting blood levels 20 minutes prior to collection
  • Urine
    • oxytocin in the blood
    • If participants void before the activity, total oxytocin secreted during the activity
Measuring oxytocin during family activities

- CSF & blood more invasive than saliva & urine

- Collection methods:
  - Saliva: drool
  - Urine: “urine collection hat”

- Preservation
  - Aliquot into samples
  - Freeze -80°C

- Measure
  - Extract
  - ELISA
Measuring oxytocin during balance & core family activities

• Research questions:
  • Is oxytocin released when couples recreate together
  • Do some form of family activities stimulate the release of more oxytocin than other activities

• Methods:
  • 40 couples recruited
  • Randomly assigned to “balance” (art class) or “core” (board games) activity
  • Collected both saliva & urine
Measuring oxytocin during family activities

• Procedure:
  • Void
  • Questionnaires
  • Collect saliva and complete urine sample
  • Activity
  • Collect saliva and complete urine sample
  • Questionnaires

• Aliquot & freeze samples
• Extract and assay with ELISA when study was completed
What we learned about measuring oxytocin

• Participants preferred urine sample collection
• More saliva samples were lost than urine, for a variety of reasons
• Urine provided more than one sample, saliva did not
• Saliva gave point measure of blood levels approximately 20 min before collection
• Urine gave measure of total oxytocin secreted during the activity
What measuring oxytocin adds to our understanding of family activities

• Oxytocin is released during family activities
  • Reinforcing the idea that these activities can increase family bonds

• Sensitive to differences in behavior
  • Subtle differences in protocols and behaviors can be detected with oxytocin measures
Pros & Cons of adding physiological measures

• Unique perspective of impact of various activities
• Relatively simple to collect
• When performed by trained personnel, results are reliable
• Equipment, time, expertise, thus often requiring collaborations