



Physiological Measures: Understanding Individuals within the Context of Family Relations

Maria L. Boccia, Maddie Larson, Karen K. Melton

Department of Family & Consumer Sciences

Baylor University



BAYLOR

Family & Consumer Sciences
Robbins College of Health and Human Sciences

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

