

THE INFANT RESPONSE TO THE FATHER’S VOICE IN THE NICU

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DISCLOSURE

I am grateful for grant funding from the Florida Association of Neonatal Nurses to purchase NIRs probes

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OBJECTIVES

Identify reasons for fathers to delay bonding with infants in the NICU
Recognize benefits of talking to infants in the NICU
Discuss the outcomes of fathers reading to their infant in the NICU

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PROBLEM

Physical barriers separate fathers from their infants in the NICU
Fathers may be reluctant to touch their infants for fear of hurting them
Physical barriers (e.g. incubators) and fear may cause delayed bonding between fathers and infants
Physical barriers should not impede talking to an infant

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LITERATURE REVIEW

Types of auditory stimulation

- Live, recorded (father’s voice)

Duration of auditory stimulation

- 8 seconds to 1 hour and 5 minutes

Gap in the literature

- Limited evidence on which to base practice for infant exposure to the father’s voice

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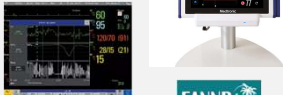
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PURPOSE

To examine the physiological responses of infants to the father’s voice

Hypotheses

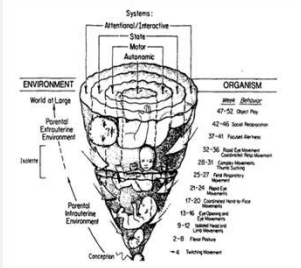
- In response to father’s live voice, infants will experience a change in
 - heart rate
 - oxygen saturation
 - respiratory rate
 - brain oxygenation



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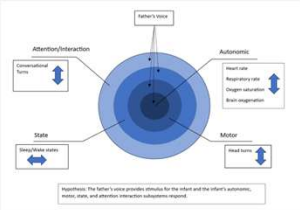
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THEORETICAL FRAMEWORK
SYNACTIVE THEORY OF DEVELOPMENT



MODEL OF THE APPLICATION OF THE
SYNACTIVE THEORY OF DEVELOPMENT

- Father's voice is stimulus
- Autonomic response includes:
 - Heart rate
 - Respiratory rate
 - Oxygen saturation
 - Brain oxygenation



RESEARCH DESIGN



- Prospective, descriptive study
- Fathers read stories to their infants
 - Standardized books read in same order
 - 10 minutes of reading
 - Books at pre-K to Kindergarten reading level
- Data collection 30 minutes prior, during, and 30 minutes after reading
 - HR, RR, SpO₂, rSO₂
 - Mean values calculated during each period



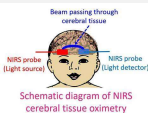
SETTING/SAMPLE

- 34-bed Level III NICU
- Dayton Children's Hospital
 - Academic teaching hospital
 - Premature and sick infants
 - Surgical services
 - Primarily private rooms
- 27 father/infant dyad



MEASURES

- Demographic data → obtained from medical record
- Mean heart rate → cardiorespiratory monitor
- Mean respiratory rate → cardiorespiratory monitor
- Mean oxygen saturation → pulse oximetry
- Mean cerebral oxygenation → Near infrared spectroscopy (NIRS)



DATA ANALYSIS

- Measures of central tendency and variance to describe all variables
- Repeated measures ANOVA used to compare physiologic data prior to, during, and after reading
- Boxplots for visual analysis of HR, RR, SpO₂, and rSO₂ variance for each participant



DEMOGRAPHIC DATA

Variables (N=27)	n (%)
Supplemental oxygen	2 (7.4)
First infant	8 (29.6)
Male infant	15 (55.6)
Father employed	27 (100)
	Mean (SD)Range
Gestational age at birth (weeks)	36.8 (4.1)25 – 42.5
Postmenstrual age at intervention (weeks)	40.0 (3.3)36.1 – 50.5
Birth weight (grams)	2985 (979)855 – 4810
Weight at intervention (grams)	3434 (901)2170 – 4958
Father's age (years)	30.2 (7.2)22 – 51

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MEAN CHANGES IN HR & RR OVER TIME

	Baseline Mean (SD)	During Reading Mean (SD)	After Reading Mean (SD)	p-value	Effect Size Partial eta ²
HR	142.3 (15.9)	140.0 (18.4)	141.6 (16.5)	.60	.02
RR	43.4 (7.1)	43.6 (9.2)	42.6 (7.5)	.71	.013

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MEAN CHANGES IN SPO2 % RSO2 OVER TIME

	Baseline Mean (SD)	During Reading Mean (SD)	After Reading Mean (SD)	p-value	Effect Size Partial eta ²
SpO2	96.8 (2.3)	96.5 (2.7)	96.4 (2.3)	.26	.051
rSO2	83.0 (7.8)	83.7 (8.3)	82.5 (8.6)	.12	.085

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HR STABILIZATION

Pre HR During HR After HR

Interquartile range for HR smaller in 68% of infants (n=25)

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LIMITATIONS

Convenience sample, may not be representative

All infants enrolled were premature or ill at birth

Obstructive apnea may confuse interpretation of respiratory rate

Short length of stay

Parent and investigator concurrent availability

2 infants removed NIRS probes

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IMPLICATIONS FOR PRACTICE AND POLICY

- Clinically important – no negative effect of voice exposure
- Some evidence for HR stabilization
- Replace noxious noise with positive impact of father's voice
- Paternal voice integrated into developmentally appropriate care
- Infant driven interventions
- Support for fathers to be present
 - Transportation, parking, childcare

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IMPLICATIONS FOR RESEARCH

- Physiologic effects need to be studied in a larger population
- Effect of prenatal exposures on infant response to the father's voice needs to be investigated
- Secondary analysis of audio, video, and qualitative data obtained during this study for behavioral state changes, motor response, and conversational turns



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