



# The Ecology of the Nursing Unit: Design, Communication, Stress and Performance

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## SELECTED Cornell RESEARCH PROJECTS

**Franklin Becker & Ronojoy Dutta**

Influence of Nursing Unit Layout on Staff Communication and Interaction Patterns  
(2007)

**Franklin Becker & Anton Villacorte**

An Exploratory Case Study of Decentralized Nursing Units  
(2007)

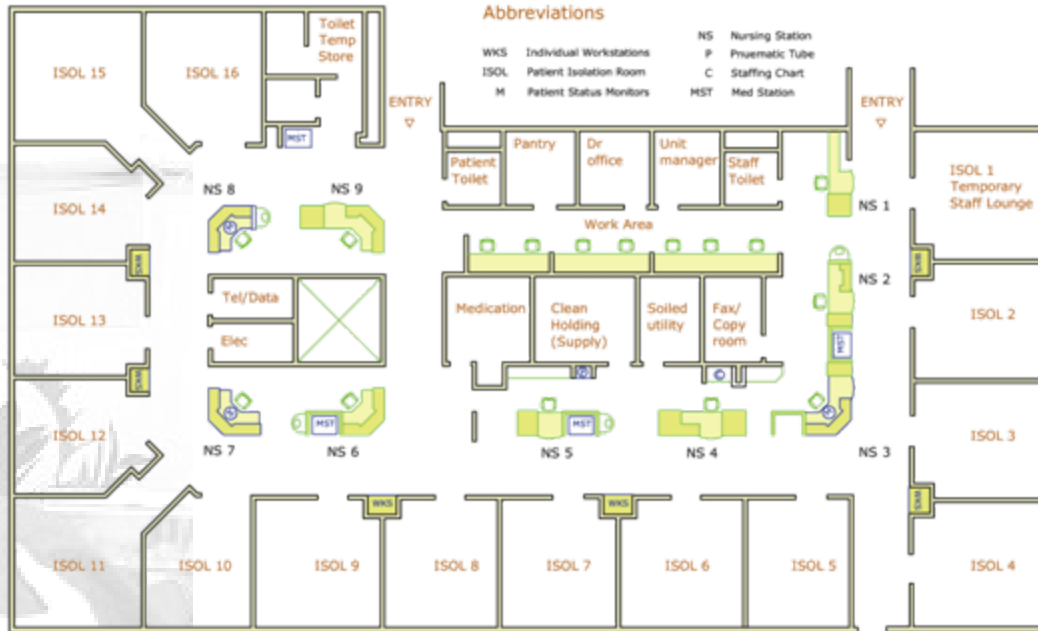
**Franklin Becker, Rosie Adams, & Sarah Hammer**

The Role of Physical Design and Informal Communication and Learning in Reducing Stress and Gaining Competency Among New Nurse Graduates  
(2008)



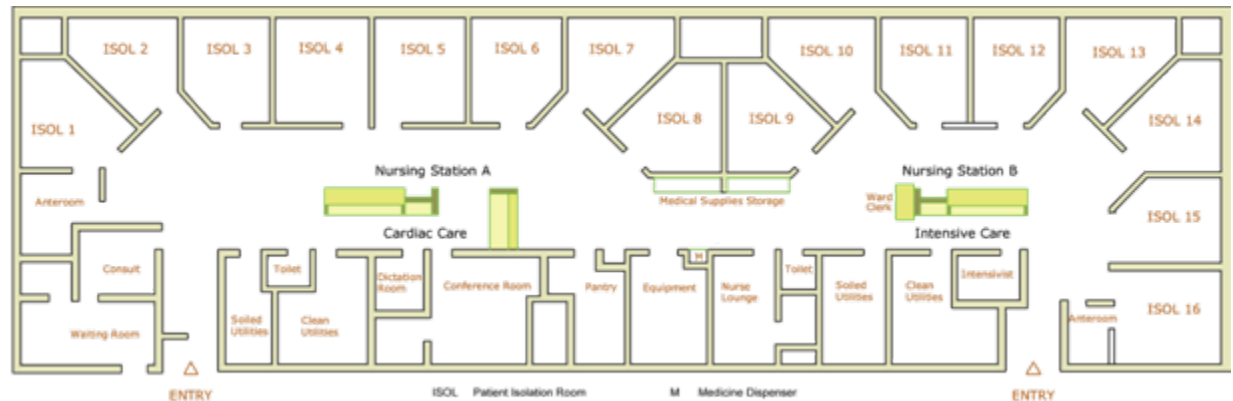
# Cayuga Medical Center

## Intensive Cardiac Care Unit (ICCU) at Cayuga Medical Center



← New ICU

Old ICU





How does the change from a more centralized to more decentralized nursing unit design affect communication patterns, teamwork and collaboration, and job stress and job satisfaction?

**Hypothesis 1:**

The frequency of communication among nurses and other clinical staff will decrease in a more decentralized unit design.

**Hypothesis 2:**

Nurses will continue to walk constantly among pods and other work areas in a more decentralized unit design

**Hypothesis 3:**

Teamwork and collaboration will decline in a more decentralized unit design.

**Hypothesis 4:**

Staff members job satisfaction will decrease and job stress will increase in a more decentralized unit design.



# The Ecology of the Nursing Unit

Systematic observations of communication frequencies and behaviors within the ICCU both before and after its relocation to a new space.

Data collected

- Professional Role
- Gender
- Duration of interaction
- Location of interaction

Sample Data Recording Sheet

|        |                            |  |      |  |  |   |   |   |   |   |
|--------|----------------------------|--|------|--|--|---|---|---|---|---|
| Time : | start                      |  | Date |  | Region                                 | A | B | C | D | E |
|        | stop                       |  |      |  |  |   |   |   |   |   |
| Staff  | RN _____ AT _____ WC _____ |  |      |  | Patient rooms unoccupied _____ (m nos) |   |   |   |   |   |
|        | Other _____                |  |      |  |  |   |   |   |   |   |

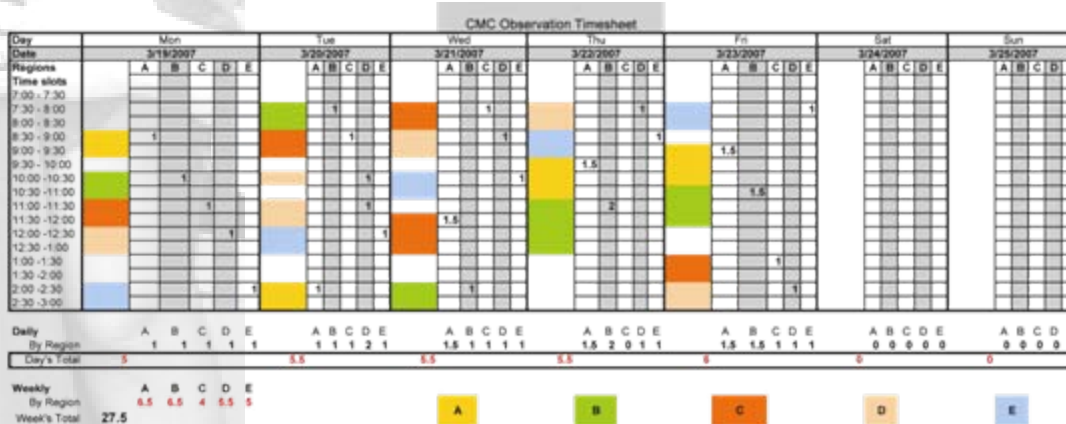
  

|    |   |    |   |    |   |       |    |   |    |   |    |   |       |
|----|---|----|---|----|---|-------|----|---|----|---|----|---|-------|
| RN | m | RN | m | RN | m | other | RN | m | RN | m | RN | m | other |
| CN | m | RN | m | RN | m |       | CN | m | RN | m | RN | m |       |
| FN | m | MD | m | MD | m |       | FN | m | MD | m | MD | m |       |
| MD | m | MD | m | MD | m |       | MD | m | MD | m | MD | m |       |
| NS | m | RT | m | RT | m |       | NS | m | RT | m | RT | m |       |
| AT | m | AT | m | AT | m |       | AT | m | AT | m | AT | m |       |
| NA | m | NA | m | NT | m |       | NA | m | NA | m | NT | m |       |
| WC | m | WC | m | CM | m |       | WC | m | WC | m | CM | m |       |
| NS | m | HK | m | HK | m |       | NS | m | HK | m | HK | m |       |
| D  | m | PF | m | PF | m |       | D  | m | PF | m | PF | m |       |

|                 |   |    |   |          |                 |   |    |   |          |
|-----------------|---|----|---|----------|-----------------|---|----|---|----------|
| length of conv. | S | M  | L | XL       | length of conv. | S | M  | L | XL       |
| location P1m    |   | P2 |   | corridor | location P1m    |   | P2 |   | corridor |
| other           |   |    |   |          | other           |   |    |   |          |

Sample Time Table



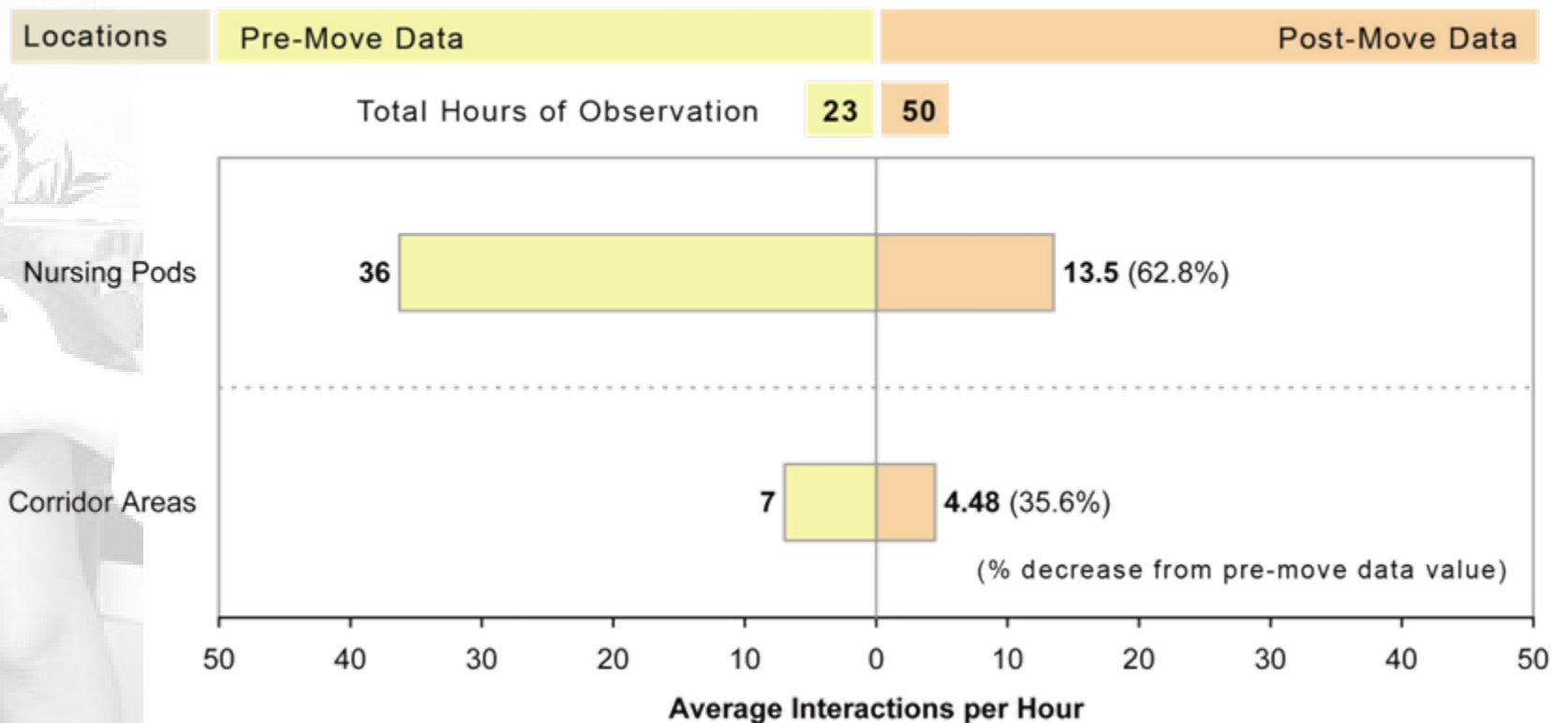
Total Observations

|      | Pre-Move | Post-move |
|------|----------|-----------|
| Hrs. | 23       | 50        |
| Obs. | 1058     | 899       |



## Results

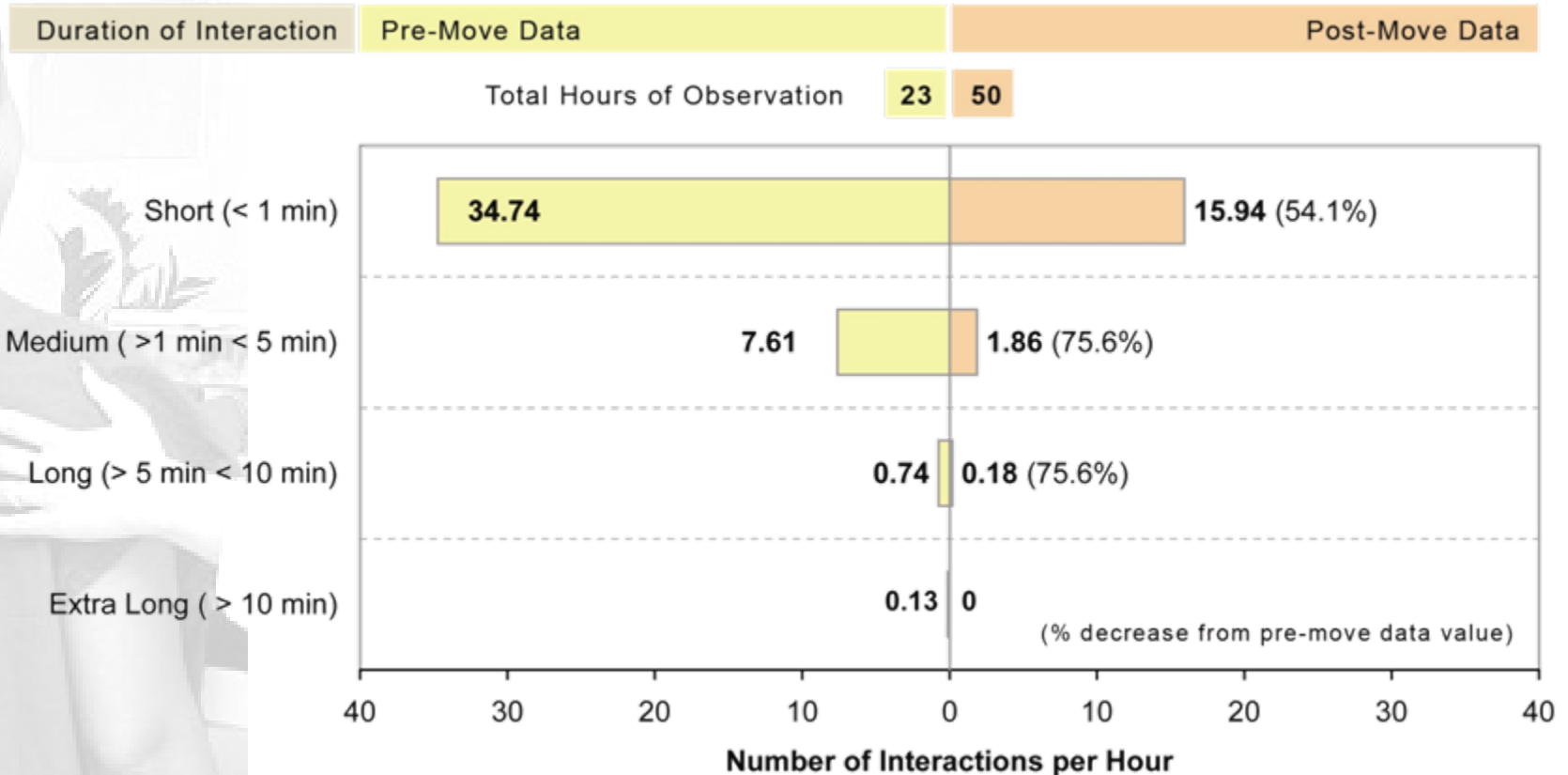
### Pre-Post Comparative Analysis by Location





# Results

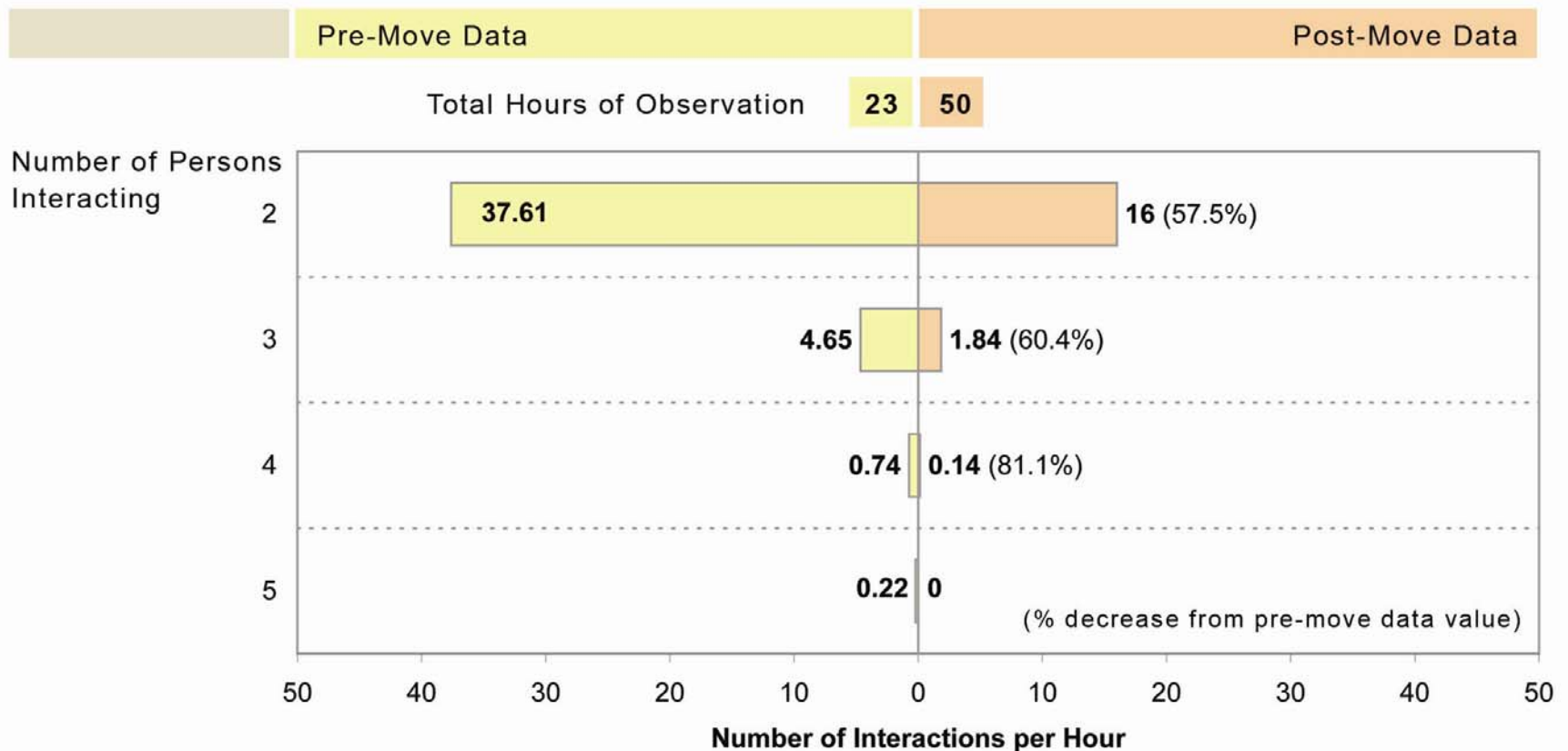
## Pre-Post Comparative Analysis by Duration





## Results

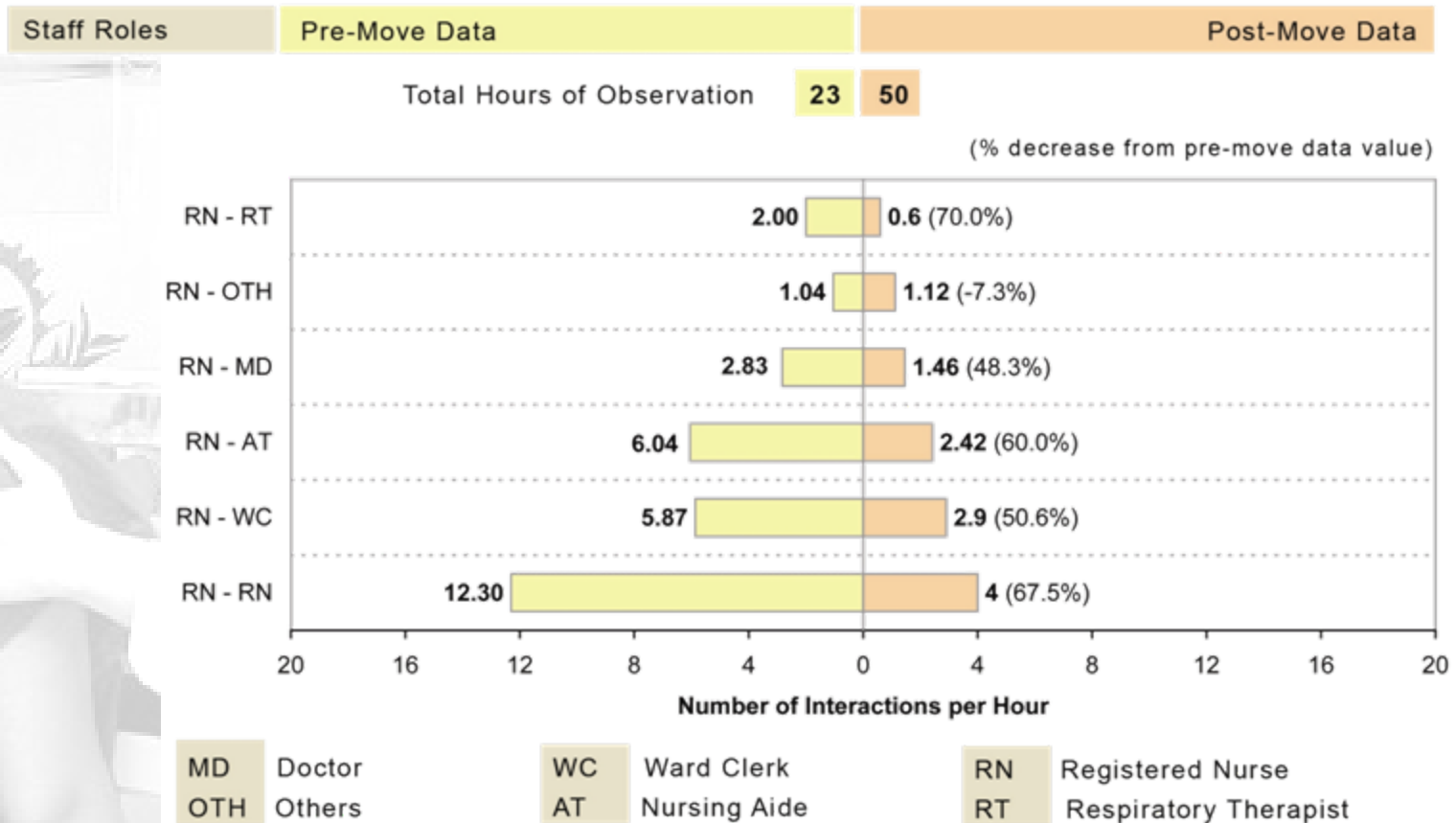
### Pre-Post Comparative Analysis by Number of Persons Interacting





## Results

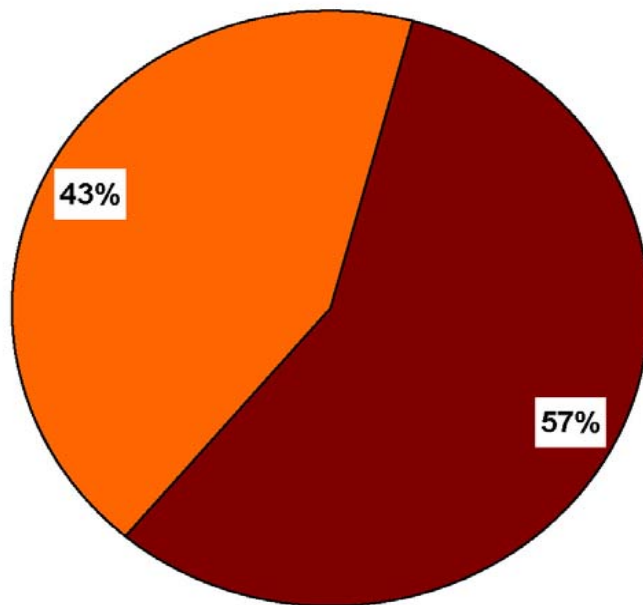
### Pre-Post Comparative Analysis by Role Pairs





# The Ecology of the Nursing Unit

Number of Individual vs Interactive Events  
(N = 1822)



## Non-Interactive Individual Events

- 67% Work
- 31% Patient Rooms
- 2% Non-Work





## The Ecology of the Nursing Unit

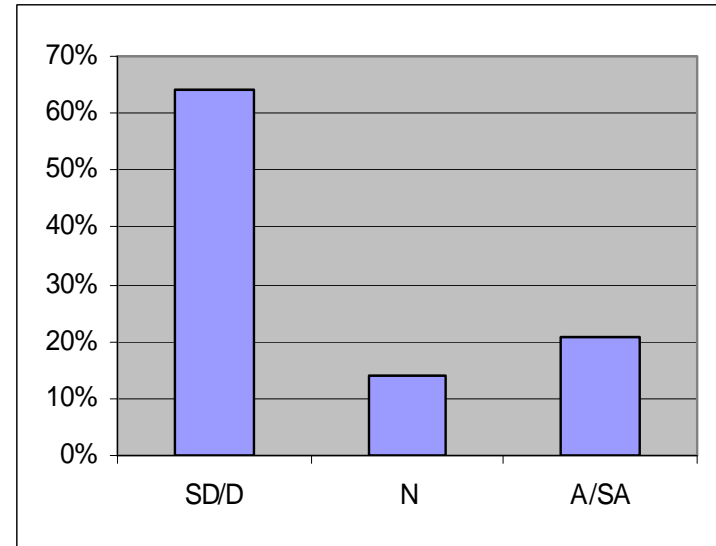
**Q4: The nursing personnel on my unit are more likely to pitch in and help one another when things are in a rush than they were prior to the move**

**Staff comments to question:**

“The isolation makes it difficult to know what is happening in other areas”

“Less likely because “pods”, walls are all barriers to unity. less ability to learn from each other, teach, know less about each others patients”

“It is difficult to help others because the unit is more spread out”

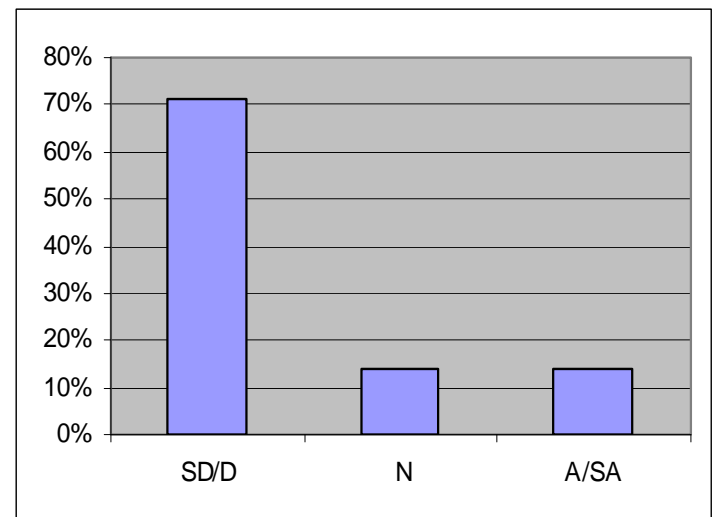


**Q5: Since relocating the ICU, physicians and staff work better together than they did prior to the move**

**Staff comments to question:**

“Less likely because “pods”, walls are all barriers to unity. less ability to learn from each other, teach, know less about each others patients”

“This is 100% related to a change in MD’s and change in companies” (strongly disagreed to question)





## The Ecology of the Nursing Unit

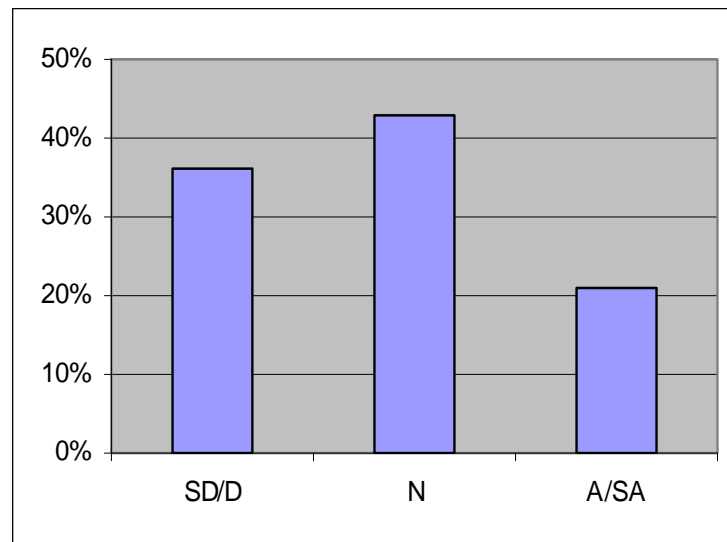
**Q17: Since relocating the ICU, I am more satisfied with my job than prior to the move**

**Staff comments to question:**

"Slightly"

"I love my job, I love my job"

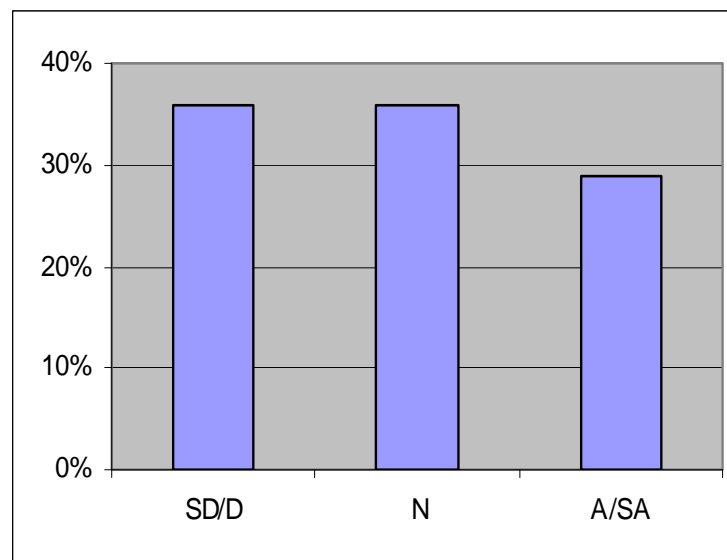
"MD related" (Disagree)



**Q10: I would be more likely to recommend this unit as a good place to work than I would have been prior to the move**

**Staff comments to question:**

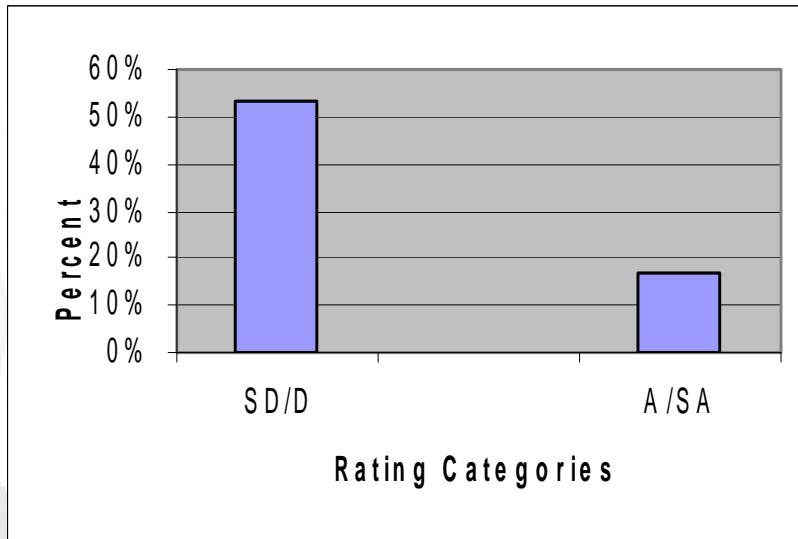
"Its cleaner, brighter – the physical"



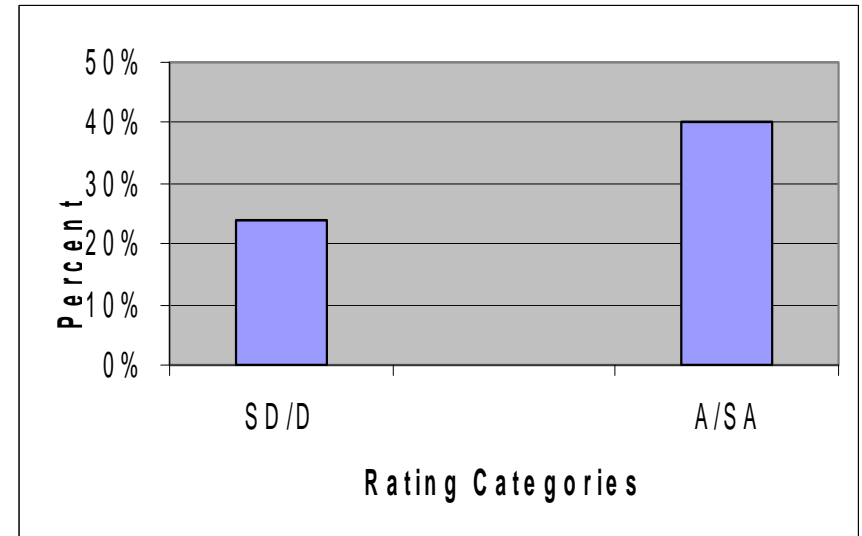


# The Ecology of the Nursing Unit

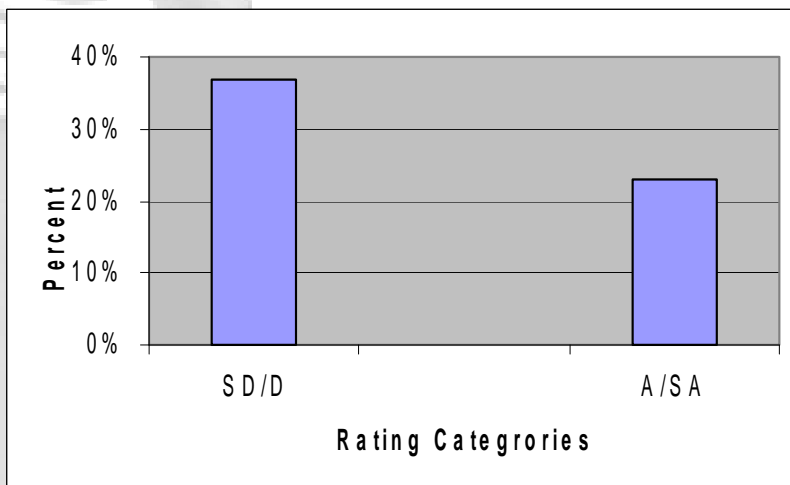
## Teamwork



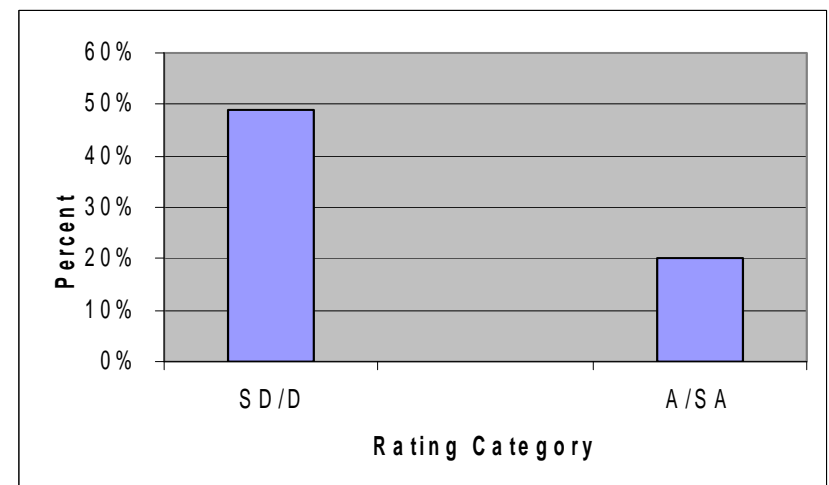
## Job Stress



## Job Satisfaction



## Valued





# Organizational Ecology

## The Ecology of the Nursing Unit

It's a System: Design, Culture, Work Processes, Technology



Physical  
Design



Information  
Technology



Work  
Processes

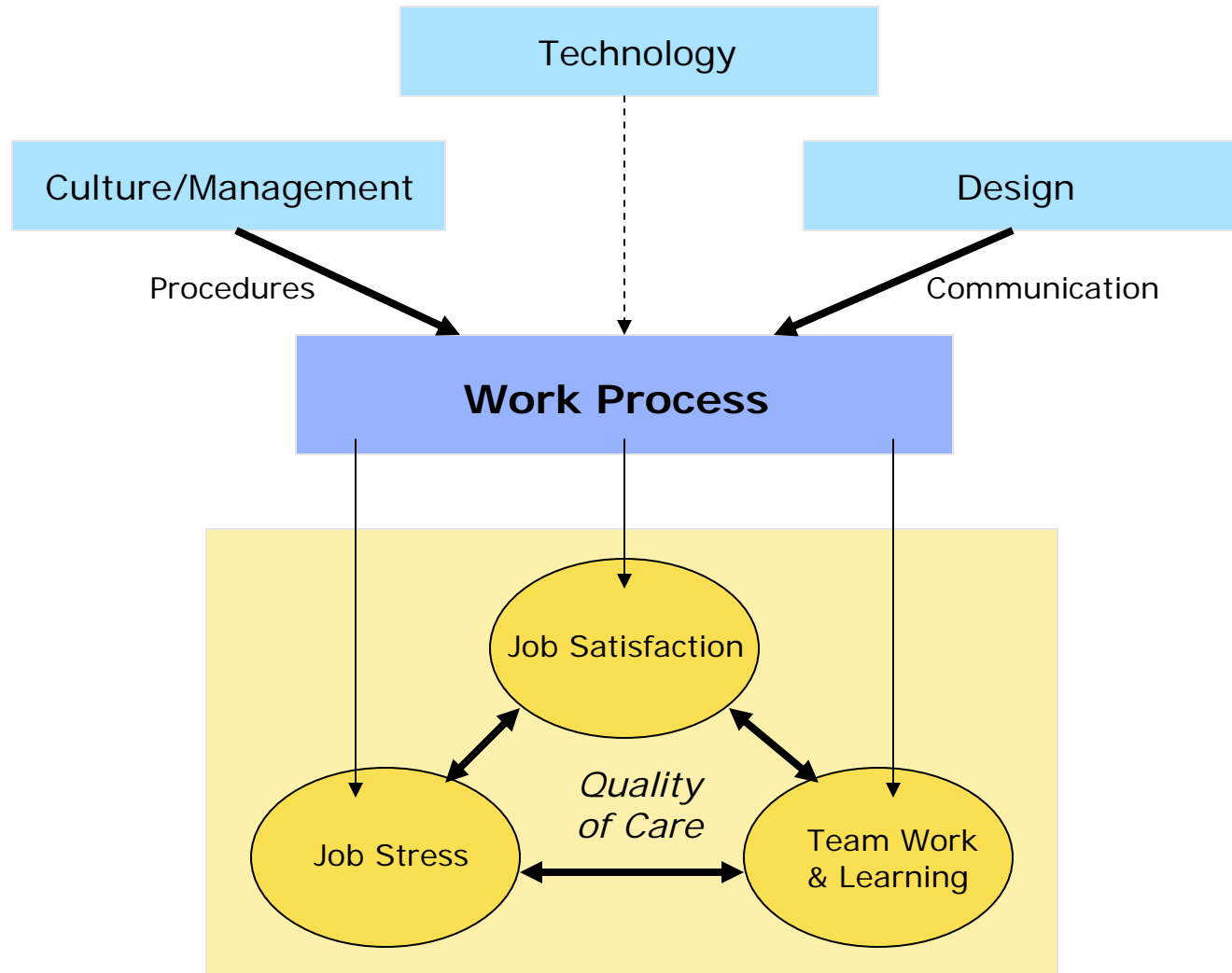


Culture



## Organizational Ecology

## The Ecology of the Nursing Unit





## New Nurse Graduate (Crouse) Study

### Research Purpose

- To **explore** the role that the physical design of a nursing unit plays during the new nurse "orienting" period in creating more or fewer opportunities for informal, on-the-job communication and learning that can help reduce stress and build competency





## New Nurse Graduate (Crouse) Study

**How does the design of the nursing unit affect communication patterns, opportunities for informal learning, competency, and job stress among new nurse graduates (NNG)?**

**Hypothesis 1:**

The frequency of communication among NNGs and other clinical staff will decrease in a more decentralized unit design.

**Hypothesis 2:**

NNG who communicate less will experience higher stress levels and slower decline in stress levels over the orienting period (12 wks).

**Hypothesis 3:**

NNG who communicate less will achieve lower competency ratings than NNG who communicate more over course of orienting period.



# The Ecology of the Nursing Unit

