

# Human Performance and Job Satisfaction in Pharmacy

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## A Problem to Solve

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“What is the relationship between performance and job satisfaction in a pharmacy?”

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**To answer the question, and  
to solve the problem....**

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- ✦ We must overcome the strong pull of;
    - ✦ Personal biases and stereotypes
    - ✦ Conventional wisdom
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**To answer the question, and  
to solve the problem, we....**

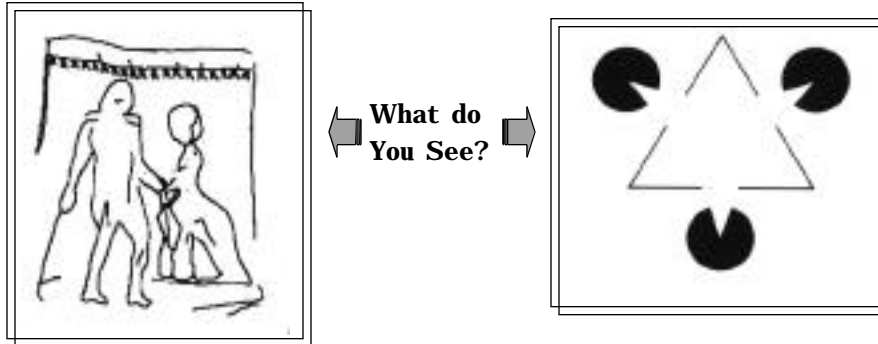
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**We must get in touch the illusions that  
cloud our ability to see what is really there.**

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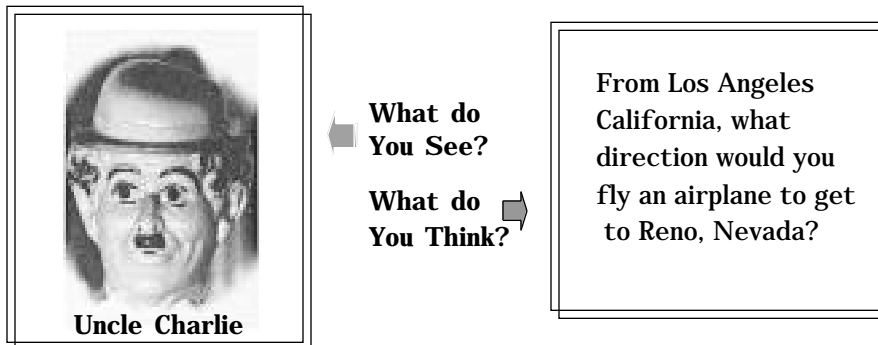
## Mental Models Affect Perceptions of Reality

- Approach to any problem occurs within some schema model, or broader paradigm that organizes the issue
- Creates a lens for what we see and how we respond



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## To answer the question, and to solve the problem, we....

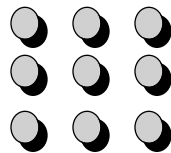
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- ✦ Must understand the critical elements of the problem
  - ✦ The boundaries the elements occupy
  - ✦ How the elements can be connected to find a solution
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## Understanding Elements, Boundaries, Connections The Nine Dot Problem

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Solve the following problem in 60 seconds  
Connect all of the nine dots below with  
three straight lines

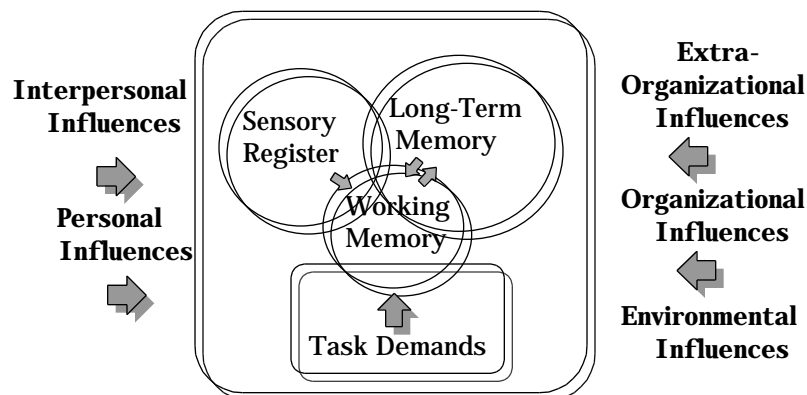


## **Overview of NACDS Education Foundation Project**

### *Components of the 18-Month Research Protocol*

- **36 Pharmacy Field-Sites in the United States**
  - Eighty-four Pharmacists/ Six Corporations
  - 12 Sites each of Low, Medium, and High Volume Pharmacies
  - Confidential and Anonymous Reporting
- **Comprehensive 241 Item Survey of 700 Pharmacists and 300 Technicians on Psychosocial Factors in the Workplace**
- **Pharmacy Simulation Studies Involving 230 People**
- **Interviews and focus groups with 100 pharmacists**
- **Review of Pharmacy and Psychology Literature on Human Performance in the Workplace**

## **Model of Human Cognitive System Serves as a Guide**



\* All Influences have an objective & subjective component

## **Making Connections among Elements ...The “P” Problem.**

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Pharmacy has a “P” problem and its not only about the confusion among product names like;

Paxil, Prilosec, Prinivil, Prozac  
Prempro, Prednisone, Provera, Procardia

Rather the “P” problem also concerns connecting...

- Psychosocial Factors
- Performance Outcomes
- Productivity & Profitability

## **Making Connections The Three Dot Problem**

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- **Psychosocial Factors**
  - Job Satisfaction & Loyalty
  - Personal Qualities
  - Perceptions of Work
  - Needs & Emotions
  - Relationship Conflicts
  - Leadership/Supervision
  - Organizational Dynamics [ roles, norms, policies, procedures ]
- **Performance Outcomes**
  - Accurate
  - Inaccurate
  - Quality
- **Productivity & Profitability**
  - Efficiency
  - Discretionary Effort

## “ The Wild Card”

- **Psychosocial Factors**

\* Added to the Equation of Traditional Factors that Influence:

### Performance

- wages & benefits
- job training
- good equipment
- pleasant work environment
- coworkers
- product to bond with

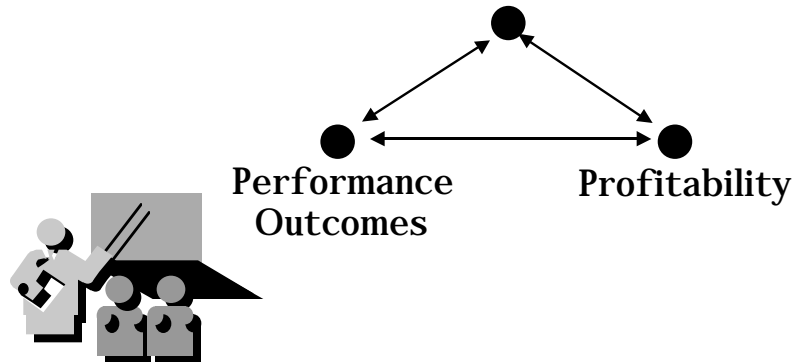
### Profits

- costs of wages & benefits
- training costs
- equipment costs
- costs of buildings  
  fixtures, lights, heat/AC
- costs of quality personnel
- costs of manufacturing/  
  purchasing product

## Connecting the Dots

### Psychosocial Factors

[Includes Job Satisfaction & Loyalty]



## Connecting the Dots



## Monitoring of Process Errors

### Self-Monitoring Process Error Form Prototype

Day \_\_: Part of Shift [ Early] [Middle] [ Late]  
Time of day you began \_\_\_ ended \_\_\_  
Scripts you helped to fill during this time frame \_\_\_\_

Correcting information to patient on telephone

Correcting script information when copying from a telephone call or FAX transmission

Date-entry changes

Product selection corrections

Count & pour changes

Corrections during normal checkpoints

Counseling patient or answering patient questions

Correcting script after it was placed in "will-call"



## Connection: Psychosocial Factors and Overall Process Error Performance

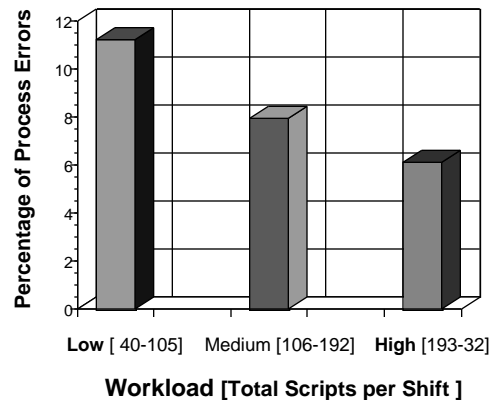
Factors below account for 38% of the process errors

- **Scripts/Hour ( 09% )**
  - Decreases in Work / Task focus decreases / Increase in process errors
- **Supervisor Effectiveness (10%)**
  - Less effective / More stress / Increase in process errors
- **Perceptions Breaks Inadequate (05%)**
  - Inadequate breaks / More stress / Increase in process errors
- **Field-Dependence / Independence (05%)**
  - Higher field-dependent scores / Increase in process errors
- **Overall Subjective Workload (05%)**
  - Less task tension / Task focus decreases / Increase in process errors
- **Light /Equip Perceived Inadequate (04%)**
  - More inadequate / more stress / fewer process errors detected

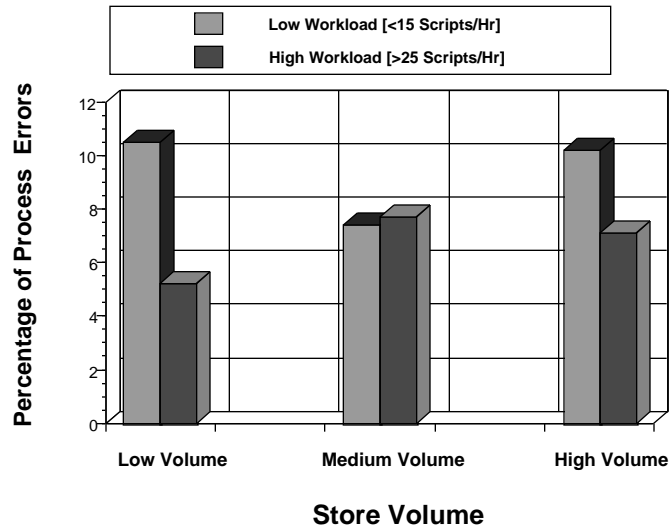
## Individual Performance and Workload

Detection and Correction of Process Errors

- Over 4 weeks, **21,672 scripts** monitored
- **9.03% rate of process errors** to scripts filled per pharmacist
- Total of **1,950 process errors**



## Individual Performance Outcomes Process Errors Store Volume & Workload



## Connection: Psychosocial Factors and Overall Process Error Performance

Those Psychosocial Factors Listed Below Predicted 34% of Process Errors

### Overall Subjective Workload or Task Related Tension

--- Less task tension/Task engagement decreased  
/More process errors

## Perceived Task Tension

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### NASA Task Load Index (Unweighted Scores)

<i>Overall Tension</i>	<i>Mental Demand</i>	<i>Physical Demand</i>	<i>Time Demand</i>	<i>Performance Concern</i>	<i>Effort</i>	<i>Frustr</i>
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*Think about your last day at work for a few moments.*

- *How many hours did you work?*
- *Approximately many scripts did you “work on either alone or as part of a team?”*

*Follow the instructions of the presenter for rating the subjective tension and stress associated with aspects of your workload using a 1 - 100 scale where 1= a very low score and 100 a very high score.*

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## Perceived Task Tension & Performance

### NASA Task Load Index (Unweighted Scores)

	<i>Overall Tension</i>	<i>Mental Demand</i>	<i>Physical Demand</i>	<i>Time Demand</i>	<i>Performance Concern</i>	<i>Effort</i>	<i>Frustr</i>
<i>[ High Vol Store ] [ High Volume &gt;25 Scripts/Hour ]</i>	<b>60.5</b>	<b>74.1</b>	<b>47.2</b>	<b>47.8</b>	<b>84.9</b>	<b>71.2</b>	<b>44.5</b>
<i>[ Low Vol Store ] [ Low Volume &lt;15 Scripts/Hour ]</i>	<b>40.1</b>	<b>46.7</b>	<b>29.6</b>	<b>23.8</b>	<b>89.8</b>	<b>41.7</b>	<b>12.6</b>

*\* Maximum Score = 100*

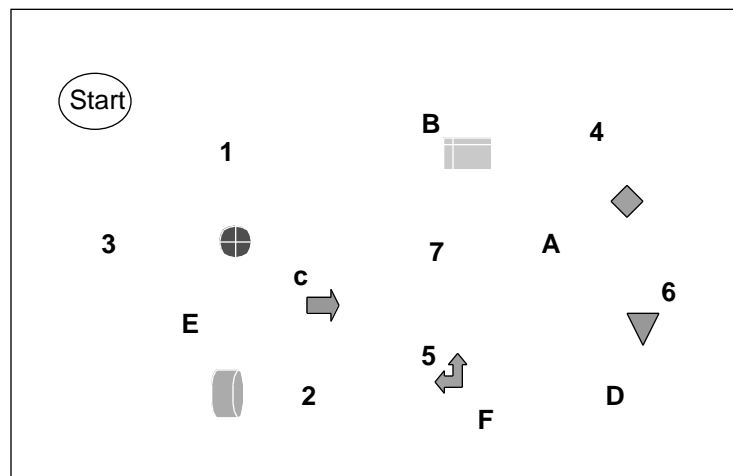
## Supervisor Perceptions & Performance

### Supervisor Dimensions [Supervisory Rating Scale]

- Overall Supervisor Skill
- Specific Dimensions of Skills  
Associated with Inaccurate Performance

- \_\_\_ Told people what to do and how to do it.
- \_\_\_ Did not establish a climate for excellence and professionalism
- \_\_\_ Overbearing when discussing expectations
- \_\_\_ Did not delegate appropriately
- \_\_\_ Did not encourage autonomy
- \_\_\_ Able to “work with people” rather than “always telling them
- \_\_\_ Tended to not give reasons for why something should be done.
- \_\_\_ Set high standards for performing tasks.

## Cognitive Style & Performance



## Cognitive Style: Field- Independence/Dependence

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- More detail oriented and less distracted  
pharmacists & technicians were, the fewer errors  
they made. [Field-Independent]
  - Pharmacy personnel who had a “big picture”  
orientation made more mistakes. [Field-Dependent]
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## Prototype Exaggerated Labels

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Loestrin**FE**

Fosamax **5** mg      Seroquel **100** mg  
0310-0271-10

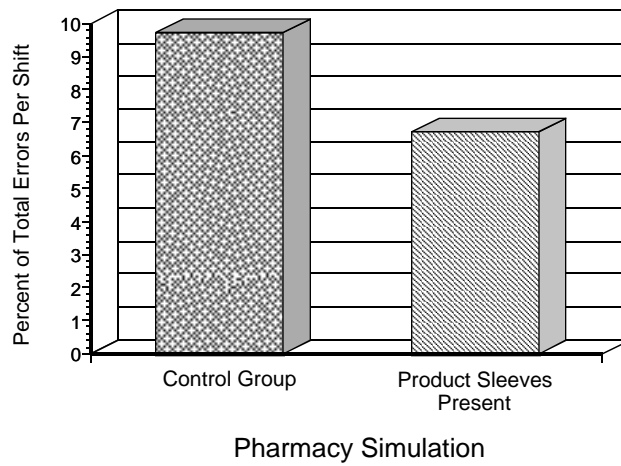
ortho **TRI** *Cyclen*      Vanceril **DS**      Prinivil **10** mg  
0085-1112-01      0006-0106-82

Zestril **10** mg

## Prototype Product Sleeves



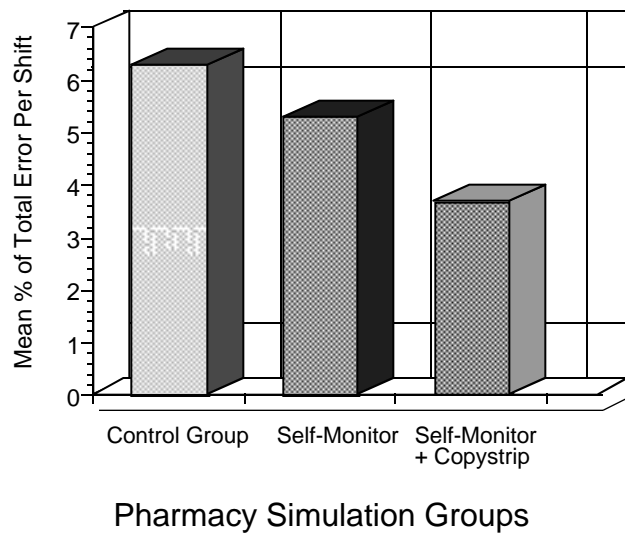
## Overall Effect of Product Sleeves on Total Errors



## Prototype CopyStrips



## CopyStrips and Error



## Perceptions of & Objective Levels of Illumination on Error

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### Objective Levels of Illumination and Error

Total Dispensing Errors

- 45 foot-candles of illumination [3.8% errors]
  - 146 foot-candles [2.6% errors]
  - 32% Improvement [ Buchanan et. al., 1991]
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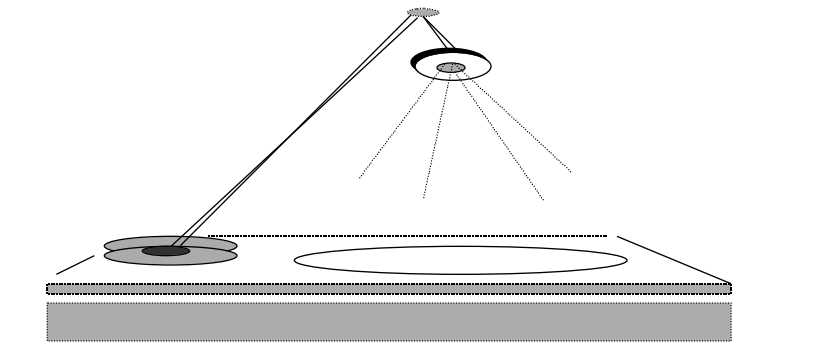
### Perceptions of Illumination and Error

Total Process Errors During Dispensing [1-5 rating scale]

- Illumination inadequate [ratings <2.5] [8.5% detected]
  - Illumination adequate [ratings >2.5 ] [11.8% detected]
  - 38.8% Improvement [ Grasha et. al., 2000]
- 

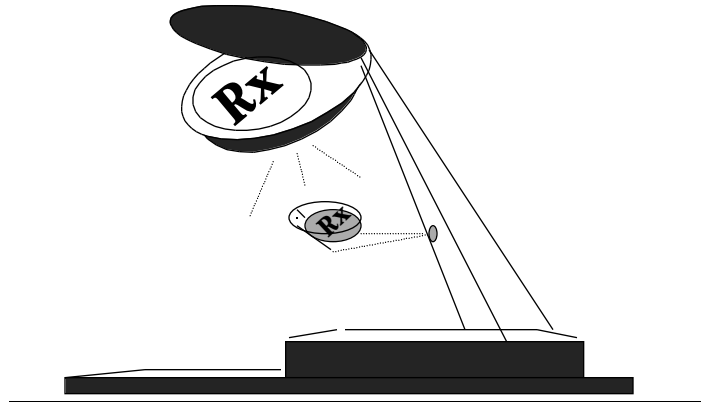
## High-Intensity Task Light

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## Magnification / Task Light

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## Effects of High Intensity Task Light & Magnification Lens + Task Light

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Among the top 5 rated prototypes by pharmacists.

- Both received high ratings for ability to increase task awareness and were perceived as increasing the ability to identify errors by 20-25%
- Were perceived as easy to use and adjust to and as reminding pharmacists to be careful.

When “used only as needed,” the effects of the Magnification Lens + Task Light increased sensitivity to process errors.

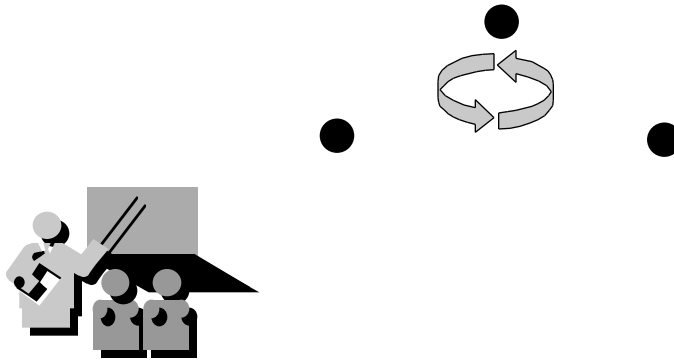
It was objectively measured to produce a 30% increase in the detection of mistakes when initially reading or verifying difficult to read scripts

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# Connections

## Psychosocial Factors

[Includes Job Satisfaction & Loyalty]



## Perceptions of Job Dissatisfaction

### Mean Job Stress Scores

[Holistic Stress Test] [95 Maximum Score]

Pharmacists / Field-Sites	48.7
Pharmacists / Surveys	49.8
Pharmacy Technicians	48.1
College Students / Part-Time Jobs	54.8
College Faculty	53.3
R&D Middle Managers	50.9
Military Reservists	49.0
Medical Residents	60.6

## **Job Dissatisfaction**

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### **Top Five Ranked Causes of Job Dissatisfaction [Holistic Stress Test]**

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#### **Pharmacists**

- Supervisor demands high job standards
  - Lack of promotions & poor pay raises
  - Inadequate feedback on performance
  - Extra effort expected-- no extra reward
  - Too many tasks to complete
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## **Job Dissatisfaction**

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### **Top Five Ranked Causes of Job Dissatisfaction [Holistic Stress Test]**

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#### **Pharmacy Technicians**

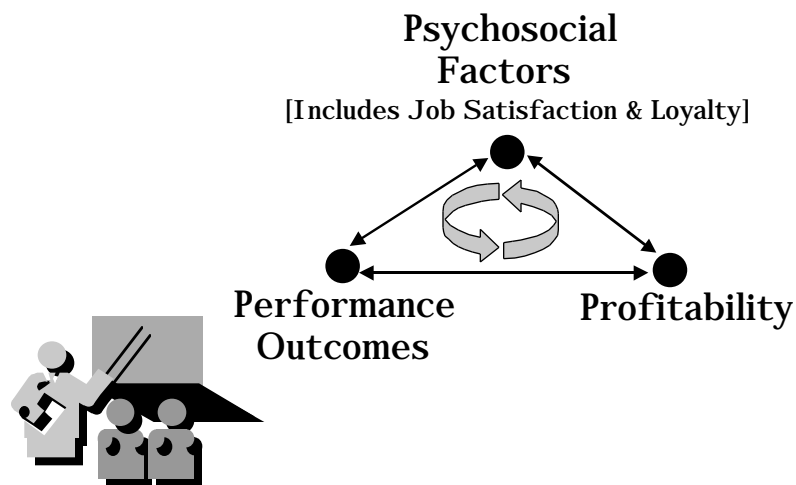
- Supervisor demands high job standards
  - Changes in policy & procedures
  - Lack of promotion & poor pay raises
  - Inadequate feedback on performance
  - Too many tasks to complete
-

## Other Psychosocial Factors & Overall Job Satisfaction

Factors Listed Below Predicted 43% of Job Satisfaction Scores

- **Supervisor Encourages Excellence**
  - When supervisor encourages people to do well  
.....more job satisfaction
- **Supervisor Encourages Independence**
  - More supervisor encourages appropriate autonomy  
.... job satisfaction increases
- **Perceptions that Pharmacy Lighting & Equipment was Inadequate**
  - More environment stress present  
....more job dissatisfaction
- **Personal Resources for Coping**
  - Better one's stress management skills  
.... Less job stress

## Inter- Connecting the Dots



## Psychosocial Factors, Performance, & Profitability

% of Process Errors  
*Lower 33% [ <4.8% P-Error ] [ n=28 ] // Top 33% [ >11.6% P-Error ] [ n=30 ]*  
*[Fewer Mistakes Made]      [More Mistakes Made]*

• Scripts per Hour	29.2*		21.7
• Job Dissatisfaction	46.1*	[ Max 90 ]	51.5
[Holistic Stress Test]			
• Concern for Quality	88.2	[ 1 - 100 ]	84.8
[ NASA TLX ]			
• Adequacy of Breaks Rating	1.7*	[1-3 rating ]	1.2
• Amount of Sleep in Hours	6.7*		6.2

\* t-tests, p < .05

## Psychosocial Factors, Performance, & Profitability

[% of Process Errors]  
*Lower 33% [ <4.8% P-Error ] [ n=28 ] // Top 33% [ >11.6% P-Error ] [ n=30 ]*  
*[Fewer Mistakes Made]                      [More Mistakes Made]*

• Impulsive Personality	7.2*	[Max score of 15 ]	8.6
[Schafer Impulsivity Scale]			
• Supervisor ratings			
- Overall Supervisor Skill	28.2*	[Max Score of 35 ]	24.8
- Encourages Excellence	6.7*	[Max Score of 10]	5.7
- Encourages Independence	12.2*	[Max Score of 15]	10.7
• Productivity [ Lower 33% in Process Errors were 35% more Productive]			
• Profitability [ Lower 33% filled 7.5 More Scripts per Hour] or [75 more per 10 Hour Shift]			

## Creating A NEST

NURTURANCE EMPOWERMENT STRUCTURE TEAMWORK



## Summary

**An understanding of cognitive and other psychosocial factors are important to understanding accuracy, job effectiveness, and satisfaction in a pharmacy**

- pharmacists would benefit from a better understanding of how the mind works and how they are affected by psychosocial processes that affect on the job performance
- courses, workshops, continuing education distribution requirements to obtain such training would be helpful
- training in stress management, conflict management, and communication skills, and supervision would be useful

**The causes of misfills and job dissatisfaction are not located in any single factor**

- multiple factors are involved and a focus on any one factor is unlikely to prove effective

**The cognitive and psychosocial factors identified are important to working effectively and accurately in CURRENT AS WELL AS IN FUTURE ROLES & TASKS OF PHARMACISTS**