

# A PRELIMINARY STUDY ON THE EFFECT OF ROLE MODELING ON ANXIETY IN MOTOR SKILL PERFORMANCE AND THE EFFECT OF SELF CONCEPT IN MOTOR SKILL PERFORMANCE

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First-year university nursing students undergo anxiety in performing basic nursing skills, particularly in the clinical setting. This is especially evident when administering an injection. At the time of giving the first injection, behavior such as shaking of hands, giggling, excessive talking, blushing, pallor and finally, verbalization of concern has been observed. Fourth-year nursing students, when asked to list the experiences which they felt caused the greatest anxiety in their nursing course, listed as their first or second choice the giving of an injection. In this study, an attempt is made to investigate whether a student's self concept influences anxiety in skill performance, and whether role modeling in the clinical setting reduces anxiety in skill performance.

Students enter the university nursing program at a time when the majority are completing the developmental tasks of adolescence. While acquiring stereotypical roles, the student is learning to cope with her own feelings. Her self-image and role identity are developing and therefore she is not an action-oriented practitioner (Dye 1974). The lower a subject's self-esteem level, the more likely she would report physiological indicators of anxiety: hand shaking, nervousness, heart pounding, palmar perspiration, etc. (Rosenberg 1966). The anxiety is manifested by interference with thinking processes and concentration, feelings of uncertainty and helplessness, blocking of communication and emotional preoccupation. Rosenberg concludes that people with low self-esteem were more likely to experience anxiety than subjects with good self-concept. As well as adjusting to the demands of university, and to the hospital as a laboratory setting, the young adult must be prepared to undergo strain exhibiting this in anxiety (Dye 1974:301). First-year nursing students, while adjusting to feelings about suffering and illness and scholastic responsibilities as they learn to apply theory to practice, find their

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most difficulty adjusting in the hospital setting. They learn that both the setting and the experiences are very real and highly intense (Smith 1966). In addition, skills which are learned in the classroom and university laboratory are performed in a hospital setting with live patients. There are few similarities between the settings which would promote the transfer of learning.

During the cognitive phase of skill development, the instructor and student analyze the skill and verbalize what is to be learned. In the nursing course, the authors suggest that alternate teaching methods might enhance student learning and reduce anxiety during this phase of skill development.

Bandura's (1963) theory of observational learning seems appropriate to the learning of injection administration; he found that the learner will produce the novel response some time later without previously having performed the skill. Two factors involved suggest the applicability of this theory to the nursing skill. Firstly, the stimulus properties of the model (e.g. female, registered nurse) promote identification, and, secondly, the consequences of the model's behavior are reinforced by the patient through responses such as "I didn't even feel it", or, "it didn't hurt at all". By having the student observe a model, we increase the initial probability that a response pattern resembling the one observed will occur (Hilgard 1966:534).

The "whole training method", whereby the student performs the entire skill, is a more efficient way of learning than the "part training method" for highly organized and difficult skills (De Cecco 1974:245). The injection of a medication could be classified in this former category. Hence, role modeling would enable students to observe the entire sequence of sub-tasks.

### *THE PROBLEM*

Role modeling in the hospital setting should contribute positively in learning to give an injection. Firstly, the student would be observing the whole training method; secondly, transfer of learning from classroom to a new setting would be promoted; and, thirdly, we would expect the learner to produce the response pattern more readily because of the stimulus properties of the model. The student's anxiety should be reduced. Students with high self-esteem should exhibit fewer symptoms of anxiety and, conversely, the opposite should be true. Within the limits of this study, self concept should relate to anxiety.

For purposes of this study, the following definitions were accepted:

*Anxiety* — a reaction to a stimulus which is recognized introspectively by the subject as anxiety and which produces a pattern of behaviour, both physiological and psychological, that is observable by the subject or other people (Munday 1973).

*Self concept* — a group of feelings and cognitive processes which are inferred from observed or manifest behaviours (Purkey 1972).

*Modeling* — the production of discrete responses demonstrated by a model (Hilgard 1966)

#### NULL HYPOTHESES

Role modeling in a clinical setting has no effect on anxiety levels of first-year nursing students when learning to administer an intramuscular injection.

Self concept has no effect on anxiety of first-year nursing students when learning to administer an intramuscular injection.

#### SAMPLE

The sample consisted of twenty-eight first-year female nursing students. The students were matched according to their grade point averages into a test and control group on the basis of Spielberger's investigation of anxiety (Kimble 1963).

#### INSTRUMENTS

Physiological responses to stress can be measured. High correlations between heart rate and psychological ratings of anxiety are reported (Cattell 1963). After considering many alternatives, Munday (1973) used a straight forward count of the radial pulse as a measure of anxiety. On this basis, radial pulse was accepted for the study.

In consultation with the Faculty of Medicine and the Faculty of Physical Education, two tests for palmar sweat were also used to measure anxiety. Firstly, an area of the right palm was painted with colorless tincture of iodine, allowed to dry and then pressed against Whatman number two filter paper which previously had been dusted with a fine starch powder. The test was performed before and after the intramuscular injection administration. Areas of sweat would appear as dark circles on the filter paper; the size and number would indicate approximately the amount of perspiration. Secondly, a semi colloidal suspension of graphite in ethylene dichloride, formvar, butyl phthalate and ethylene dichloride was applied to alternate index fingers, and then the dry plastic was lifted onto a piece of scotch tape. The results would then be transferred to a microscopic slide which, when enlarged, would show numbers of black dots indicating sweat gland orifices.

The Tennessee Self Concept Scale, developed by Fitts in 1963, was used to assess each subject's self concept. The advantages of this scale

are that it is easy to complete, widely applicable, well standardized and multi-dimensional in its description statements (which the subject uses to portray his own picture of himself), and it can be completed in ten to twenty minutes. The total positive score (P) is the most important single item and reflects the overall level of self-esteem. Persons with high scores tend to like themselves, feel they are persons of value and worth, have confidence in themselves and act accordingly. The distribution score (D) is a summary score of the way one distributes his answers across the five available choices in responding to the items. It is interpreted as a measure of still another aspect of self-perception. High scores indicate that the subject is very definite and certain in what one says about himself (Fitts, 1963).

### PROCEDURE

In learning to administer medications, teaching methods included lectures, videotape demonstrations, slide-tape demonstrations and availability of equipment for student practice. The test group observed a registered nurse perform the skill in the hospital whereas the control group did not. Two days following the role modeling, the students completed the Tennessee Self Concept Scale. Their radial pulses were taken and recorded. The two sweat tests were administered and the subjects gave the intramuscular injection. The three physiological measures were then repeated.

### ANALYSIS

#### ANALYSIS OF VARIANCE: $N = 28$

Source of Variation	df	Mean Square	F ratio
Variable: experimental-control	1	4.762	
base, pre, post pulse	2	632.710	12.31**
students (within groups)	26	289.850	
group x base, pre, post	2	61.760	1.20
students x base, pre, post	52	51.390	

#### DESCRIPTIVE STATISTICS ON PULSE RATE, "D" AND "P" SELF CONCEPT DATA

##### EXPERIMENTAL GROUP $N = 14$

	Mean	S.D.	Pearson Correlation Coefficient				
			Base	Pre	Post	D	P
Base pulse rate	77.4	7.82	1	x	x	x	x
Pre pulse rate	82.1	9.69	0.765**	1	x	x	x
Post pulse rate	83.7	9.64	0.557*	0.742**	1	x	x
"D" <sub>1</sub> self concept	108.4	21.60	0.315	0.390	0.264	1	x
"P" <sub>2</sub> self concept	338.9	35.68	0.446	0.605*	0.374	0.754**	1



# CONTROL GROUP N = 14

	Mean	S.D.	Pearson Correlation Coefficient				
			Base	Pre	Post	D	P
Base pulse rate	73.6	10.68	1	x	x	x	x
Pre pulse rate	82.9	11.09	0.638**	1	x	x	x
Post pulse rate	85.4	17.38	0.624**	0.608*	1	x	x
"D" <sub>1</sub> self concept	95.0	25.45	0.530*	0.316	0.090	1	x
"P" <sub>2</sub> self concept	329.0	28.49	0.359	0.232	0.029	0.883**	1

\*p equal to or less than .05

\*\*p equal to or less than .01

D - descriptive score for Tennessee Self Concept Test

P - total positive score for the Tennessee Self Concept Test

## RESULTS

Role modeling in a clinical setting has no effect on the anxiety levels of first-year nursing students when learning to administer an intra-muscular injection. Interaction between base, pre and post factor and experimental control (e.g. treatment) factor is moderate and not significant at the five per cent level. One cannot argue that treatment had a differential effect or had an effect superior to no treatment.

The change from base to pre to post in pulse rate was highly significant, which suggests that a situation causing physiological changes in pulse measurement occurred around the time of recording of pulse rates taken before and after the injection.

Self concept has no effect on anxiety in first-year nursing students when learning to administer an intramuscular injection. In the experimental group, the pre pulse rate was significant with one of the self-concept scores.

Although much effort was involved in testing palmar sweat, the volume and storing of the results unfortunately precluded the gathering of any conclusive data.

## SUMMARY AND DISCUSSION

The significant change in pulse rate may not have been due to the injection procedure but rather to other factors such as completing the self concept test, being supervised while giving the injection or merely waiting one's turn to give the injection. The pre pulse rate which was significant with one of the self concept scores in the experimental group could suggest a relationship between self concept and anxiety. It is not conclusive evidence that self concept and anxiety are related factors in giving an intramuscular injection.

The hospital environment was difficult to control due to the necessity of co-ordinating the staff member, patient care, a sufficient

number of injections at the right time and viewing of the whole procedure by all students. Two role models were used on different wards to ensure a sufficient number of injections, as well as adequate space for each student to observe the procedure within the confines of the small patient's unit. Differences could occur due to differing model stimulus properties. As well, some of the control subjects observed administration of an intramuscular medication in the hospital prior to the study; incidental learning in the clinical setting is hard to assess and control.

Two observers were required to record pulses and administer the sweat tests when the study was done and presumably discrepancies could occur. Electrical devices were not used to eliminate observer error in pulse recording.

A teacher's perception of a student's self concept does not relate to scores on the self-concept scale. In fact, such characteristics as quietness, withdrawing, nervousness and not speaking out are probably more related to the introvert-extrovert dichotomy rather than self-concept.

The investigation of two hypotheses, although convenient regarding subjects, time, numbers, etc., made the study itself unwieldy. The time relationship between theory, modeling and performance did not appear to create obstacles for skill development. A pretest was not used as the validity of the physiological measures was well documented and the self-concept had previously been tested.

Testing the anxiety level by physiological means and self-concept tool using a recognized scale is not specific enough to measure the effect of modeling. Our preliminary investigation could be repeated and measured by an evaluative tool which would indicate the subject's level of proficiency. Such a tool might be based upon behavioural objectives as well as a videotape of the performance so that it could be judged by independent observers.

Since the optimal arousal level for peak performance is important during the early stages of skill learning it may be more pertinent to manipulate the subject's state of arousal as measured by physiological indices such as palmar skin conductance, blood chemistry, changes or circulatory responses (Stallings 1973).

Bandura suggests that following observational learning, immediate reinforcement by verbal description is very meaningful (Hilgard, 1966). Hilgard (1966) states that further benefit is derived from actual practice and reinforcing feedback rather than further observation. The effect of immediate reinforcement may be the most positive contributing factor in skill learning.

As many complex skills are learned by first-year nursing students, teachers should consider all the variables in learning a particular motor skill. If anxiety is markedly increased in students, our teaching methods should be adapted accordingly.

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