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Editors

W. Christopher Scruton

Stephen Claas

Layout

David Brown

Logo Design

Ruth Cronje, and Jan Swanson;

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Cover Design

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Pigs bring out the worst and the best in people

Madonna E. Benjamin DVM, MS

Introduction

*Personality traits are defined "as a characteristic of an individual that exerts pervasive influence on a broad range of trait relevant responses."*¹

Hinde² explains that the individual establishes a repertoire of behaviors to be used in various situations, providing general capabilities, which can then be adapted by humans to further expand the repertoire of successful behaviors as new events arise. Another hypothesis, explained by Ajzen, is that consistency in behavior is greater when the situation exceeds the level of competence. In that study, behaviors of emotionally challenged children reflecting aggressiveness and withdrawal were examined. These participants were challenged with situations that were either within their competency or exceeded their competency. Behavior consistency was higher when challenged beyond competency, suggesting that, under stress, humans are more likely to resort to a known and familiar repertoire of behavior.

Self-esteem, the evaluation of one's self, consists of a range of extremes from the feeling of complete worthiness as a valuable member of society to the feeling of worthlessness.³ Generally, when a person experiences success or failure, he or she assesses that performance against an inner standard. Self-esteem is an evaluation of the information contained in the self-concept and is derived from a child's feelings about him or herself.⁴ When the perceived and the ideal selves are a good match, the self-esteem will be good.⁵ Based upon this knowledge, William James⁶ offered a simple, profound, well-established, formula for self-esteem:

$$\text{Self-esteem} = \text{Successes/Pretensions}$$

Pretensions are the expectations we place upon ourselves. Therefore, when successes exceed expectations, higher self-esteem results.

Personality, self-esteem, and the stockperson

Seabrook⁷ conducted one of the pioneer efforts utilizing personality scores as a basis for successful stockpersonship within the dairy industry. In this study, Seabrook followed twelve, single-operator dairy herds of

similar genotype, building design, and feeding program for a period of six years. Analysis of herd records revealed interesting information of the effect of different stockpeople, with similar resources, on milk production (liters/cow/day) and cow behavior. This study showed that substituting the stockman of high producing farms with another stockman might result in a drop in milk yield. Alternatively, changing the stockman of low producing farm usually resulted in a marked increase in milk yield. Cows managed by the stockmen of high producing farms came into the parlor more easily than those farms with lower production. When the stockmen were assessed by various techniques for personality traits, Seabrook found the stockman associated with high production yields and easily managed cows were confident in their vocation yet introverted. This early interpretation of the high achieving stockperson as "the confident introvert" suggests a correlation between the personality traits and the positive interaction of the person with their animals. In a later longitudinal study, Hemsworth et al.⁸ evaluated the achievement of 12 different stockpeople from farms with similar resources. The results suggest that the behavioral responses of sows to the presence of the human are positively associated with the reproductive efficiency of the sows. He concluded that successful stockpeople are conscientious, caring, eager to learn, humble, and have good observational skills of pig behavior.

Other work^{9,10} revealed characteristics common to good stockpeople, these included confidence, independence, consistency, low aggression, and stability. In a more recent study using a 16 trait personality test, Ravel et al.¹¹ performed a psychodemographic profile of 86 stockpeople from swine farms in Quebec. Demographic data were obtained through interviews. The study population was predominantly male and the participant criteria required that the stockperson was solely responsible for and working within farrowing units. In general terms, all stockpeople working in these farrowing units were high-scoring on emotional stability, conformity, self-discipline, and introversion. Based on the aforementioned research,^{9,10,11} a composite personality of the stockperson may be characterized as introverted, emotionally stable, serious, conscientious, reserved, and controlled.

Predicting and measuring human personality, self-esteem, and problem-solving behavior

Two theoretical perspectives were tested to understand the implications for understanding stockperson characteristics and actions. One involved the role of the personality in predicting subsequent behavior in unfamiliar and unpredictable settings. The second focused on the behavioral response of the pigs to the handler.

Materials and methods

Study population

One hundred and thirteen animal science students enrolled in an animal handling course at Michigan State University completed a demographics questionnaire and a self-esteem scale survey developed by human psychology researchers at Michigan State University. The scale survey was composed of 58 statements concerning an individual's evaluation of himself or herself, (e.g., "On the whole, I am satisfied with myself.").

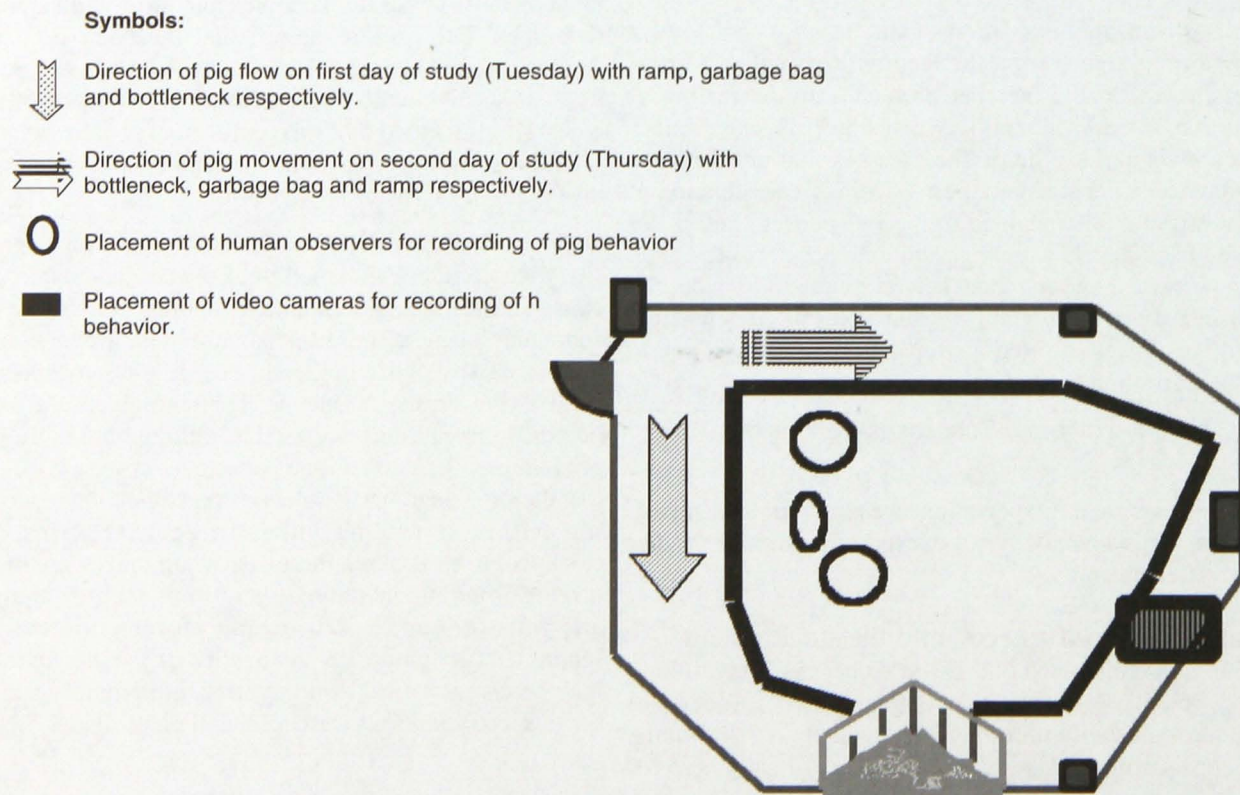
Two treatment groups, (20 students/group) of high self-esteem and low self-esteem were selected from the highest and lowest percentile scores for self-esteem and matched based on gender, day of study, and time of day.

The study was conducted over two days and students were asked to move a group of three pigs through an obstacle course. The circuit contained three obstacles similar to an on-farm or pig transportation situation. One obstacle included a wooden ramp with 0.9 meters on both rise, 1.63 meters in length, 0.43 meters in height and 2.5 cm cleats placed every 8-9 cm. The second obstacle was a square black garbage bag, 2.4 square meters, representing a slightly slippery floor surface and the third obstacle was a narrow passage region or bottleneck 0.43 meters in width. On day one, the first obstacle was a wooden ramp followed by the black garbage bag and then the bottleneck. To minimize the learning affect by the pigs that were studied twice, the circuit was reversed on day two (two days later) with the bottleneck, garbage bag, and ramp as first, second, and third obstacles, respectively. (See Figure 1.)

Behavior

Human behavior, pig behavior, and human-pig interaction was documented using direct observation, focal sampling, and continuous recording. The recording media included video- and audiotapes. Circuit entry and exit points were standardized, and time in the circuit was re-

Figure 1. Schematic diagram of a circuit containing three obstacles. A wooden ramp with a 27° angle, a black garbage bag as a slippery surface, and a narrow passage (bottleneck) region. The circuit is designed to observe pig behavior, human-pig interaction and human behavior while pigs are moved by the student handlers.



corded for the duration of each pig and the handler. Time was documented using a stopwatch and verified against time recorded on videotape.

Human behavior

Eight different handler behaviors were coded by trained observers. The definitions of these behaviors are listed in **Table 1**. In general, the coded behaviors were selected to reflect three underlying approaches to handling:

- The use of force (pushing, slapping, slapping head)
- The use of non-forceful directing (patting, blocking, bumping, and speaking to the pigs)
- The use of a wooden gate or hurdle that participants were instructed to use to direct the pigs through the circuit (task)

Pig behavior

Ten different pig behaviors were coded by trained observers. The definitions of these behaviors are listed in **Table 2**. In general, the coded behaviors were grouped to reflect two underlying responses that pigs could make to the handler:

- Escape (escaping, turning, balking, freezing, backing up, squealing, and high pitched grunting, and/or squealing)

- Exploration (rooting, nosing, and low pitched grunting)

Statistical analyses

PROC GLM, PROC MIXED and PROC CORR were used from SAS software library (SAS/STAT, Guide for Personal Computers, Version 11.6 Cary, North Carolina: SAS Institute Inc., 1994). Non-normality was determined by using normal probability plots. Human behavior and pig behavior were separately correlated using a correlation analysis. A two sample Student’s t test was used to compare cortisol measure of pigs repeating the circuit. Significance was established at $P \leq 0.05$.

Results

Our first hypothesis proposed that high self-esteem persons would use more “Directing” problem solving behaviors (e.g., bumping, patting) and fewer of “Force” (e.g., slapping, pushing), than would low esteem persons. We also expected that, regardless of esteem, when provided with a tool (hurdle), most individuals would comply to the “task” with a given tool. **Table 3** presents the mean composite scores of each of these problem-solving approaches. Note that on both the Directing and Force behavior composites, the hypothesis was strongly supported.

Table 1: Human behaviors categorized and defined.

Human behavior	Definition
Bumping	Use of the body or gate to exert abrupt and short lasting pressure to the pig, followed by release of pressure or the handler stepping back slightly.
Pushing	Use of the body or gate to exert a constant pressure on the pig to move pig in forward direction.
Blocking	Use of the body or a gate placed perpendicular to the pig, providing an immobilized barrier, to prevent pigs from retreating or escaping.
Gating	Use of the gate, by handlers, placed between the handler and the pigs to direct movement of the pig.
Parallel gating	Gate is positioned parallel to the body of the pig.
Slap	Contact or striking with the hand on the pig’s body. The action is made by a full flexion from the elbow.
Slap head	Striking the pig’s head using the hand, gate, or feet.
Vocalization	Verbal communication directed to the pigs; includes whistling, talking, hooting, pishing.
Patting	Contact with hand on the pig’s body. The action is made by a full flexion of the wrist.
Problem-solving	Cumulating behaviors by handlers such that the individual and different variables are summed in the first 50 seconds of the circuit time and the repeated behaviors are not included in the calculation.

Table 2: Pig behaviors categorized and defined.

Pig behavior variable	Description
<i>Movements</i>	
Balking	Resisting forward movement while standing firmly and leaning against the handler or gate.
Freeze	Standing motionless, independent of the presence of the handler, while looking forward. Ears are pricked.
Stop	Pig has stopped motion (walking), may investigate surroundings.
Rooting	Rubbing the rooting disc into and on the flooring surface while in a standing position.
Lying down	Lying or sitting passively lasting for more than five seconds and without pig performing another behavior.
Nosing	Rubbing of the rooting disc against materials such as obstacles, penning, and human feet. Includes pigs standing still or walking.
Turning around	Pig turns around to change field of vision prior to moving in the opposite direction.
Escaping	Pigs moves away from the obstacle, past the handler, toward the beginning of the circuit.
Esc:Turn	The pig must turn in order to reposition itself to move in the opposite direction and to move past the handler. Escape to turn ratio is a calculation of the number of escapes by an individual pig divided by the number of times the pig turned around.
Eliminative behavior	Urination and defecation.
<i>Vocalizations</i>	
Low grunt	Low tonal calls, associated with rooting or nosing an object.
High grunt	High-pitched tonal sounds, pig is generally excited.
Squealing	Intense, high-pitch vocalization, pig is generally resisting handling.

i) Other categories include walking (**WALK**) and running (**RUN**) were not included in the analysis because these variables were states whereas the other variables were counted as events.

ii) **Bold type** indicates the category of pig behavior used in statistical analysis.

Table 3: Handler’s self-esteem and use of directing, force, and task behavior.

Handler behavior	Handler’s self-esteem		
	Low	High	P value
Directing	2.36	6.16	0.01
Force	11.87	6.33	0.01
Task	2.42	1.82	NS

There was no difference between types of persons in their use of the instructed task behavior.

Data in support of the second hypothesis, which concerned pig behavioral response to the handlers, is shown in **Table 4**. This shows the pig’s Exploratory behavior score was significantly higher with high esteem individuals.

Conclusions

The role of the stockperson continues to change as the industry endeavors to improve productivity. Pigs, traditionally trained in handling and transport, have an increased fear of the novelty of transport at market age when the pigs are older, larger, and physically challenging for handlers.

Table 4: Handler's self-esteem and pig's behavior.

Pig behavior	Handler's self-esteem		
	Low	High	P value
Pig distress	1.44	1.03	NS
Exploratory	0.66	1.35	0.01

Pig responses were qualitatively affected by the problem-solving ability of the stockperson in normal and often unpredictable situations encountered when moving pigs. The present study provides qualitative information regarding the impact of on-farm handling strategies on behavioral responses of pigs.

Personality profiles may provide a better understanding of the employees when recruiting or targeting recruits. However, each stockperson is a compilation of personal experiences and varying degrees of success, placed in a situation of unknown determinants of pig handling. Therefore, to predict human behavior as it relates to personality traits, gender, and livestock handling experience, it is important to establish a base rate data of handler strategies to better predict human pig interaction for future studies. The present study provides some initial data of human behavior while handling juvenile pigs.

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